SWRDICI

西南化工研究设计院有限公司

SOUTHWEST RESEARCH & DESIGN INSTITUTE OF CHEMICAL INDUSTRY CO.,LTD

以人为本·务实创新

HUMAN-ORIENTATION

PRAGMATIC INNOVATION

SWRDICI 西南化工研究设计院有限公司

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西南院简介

ABOUT SWRDICI

西南化工研究设计院有限公司（简称西南院）始建于1958年，是集科研、技术开发、工程设计、工程承包与管理、技术咨询与服务、产品生产和科技贸易为一体的原化工部直属重点技术开发型院所。1999年7月由事业单位整体转制为科技型企业，2012年6月改制为有限责任公司，隶属中国化工集团公司旗下的中国昊华化工集团股份有限公司，注册资本32862.88万元。

西南院是国家高新技术企业，国家级知识产权示范企业，全国创新型试点企业，通过了质量管理体系(ISO9001)、环境管理体系(ISO14001)、职业健康安全管理体系（OHSAS18001）认证。

西南院长期从事天然气化工、煤化工、碳一化工、工业排放气净化与综合利用、节能环保、特种气体与标准气体、化工自动控制、专用催化剂的研究、工程开发、技术转让与产品生产。西南院始终秉承“以科技创新为先导，以工业化应用为重点，引领带动产业技术进步为目标”的发展理念，以开发我国资源、能源、环境等重点领域关键技术与共性技术为己任，具备了较完善的科技创新服务体系。

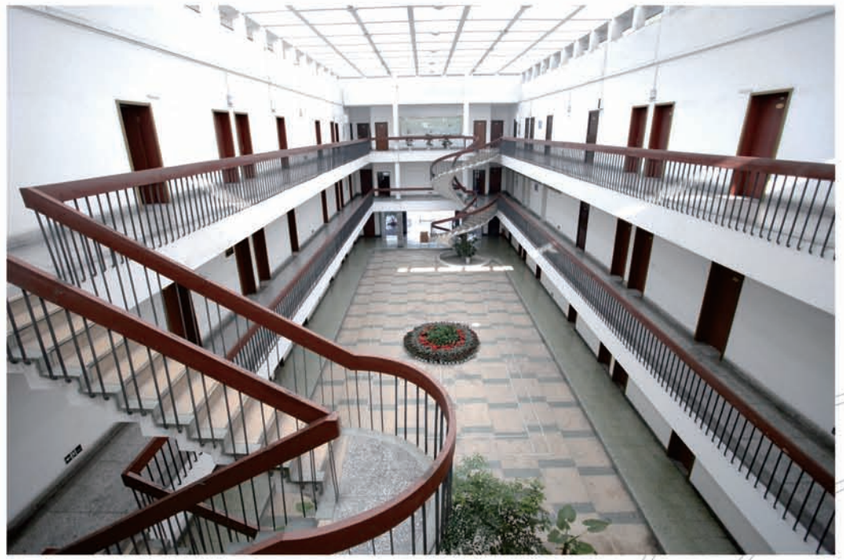
近年来，西南院紧紧依托“工业排放气综合利用国家重点实验室”、“国家碳一化学工程技术研究中心”、“国家变压吸附技术研究推广中心”、“全国气体标准化技术委员会”等国家级科技创新平台，承担了“非石油路线制备大宗化学品关键技术开发”、“矿产废弃资源循环利

以人为本 务实创新
Human-orientation, pragmatic innovation

用应用基础研究”、“二氧化碳转化为天然气关键技术”、“焦炉气甲烷化制天然气”等国家科技支撑计划、973计划、863计划、国家重大科技成果转化项目。拥有焦炉气甲烷化制天然气、甲醇羰基合成醋酸、甲醇制二甲醚、甲醇裂解制氢、粗苯加氢精制、甲酸甲酯法合成N-甲酰吗啉、中低压合成甲醇、甲烷化催化剂、烃类转化催化剂等国内领先技术成果。焦炉气补碳甲烷化制天然气、电石炉尾气综合利用、黄磷尾气深度净化、工业排放气制乙二醇、醋酸加氢制乙醇、煤制合成天然气等新技术成果的产业化，形成了一批代表我国在碳一化工、煤化工及节能环保领域先进水平的核心技术，广泛应用于化工、石化、石油、焦化、冶金、能源等行业。

西南院已累计完成科研项目700余项，其中100余项（次）获得国家和省、部级科技奖励（获得国家科技进步一等奖2项），申请专利269项（其中发明专利233项），获得授权专利148项（其中发明专利115项），制修订国家气体标准130余项。

西南院投资子公司——昊华（成都）科技有限公司位于四川新津工业园区，规划占地1400亩，其中一期用地500亩。主要从事一、二、三类压力容器的设计及制造，甲烷化催化剂、二甲醚催化剂、甲醇裂解制氢催化剂及N-甲酰吗啉的生产、销售与售后服务。



Founded in 1958, the Southwest Research and Design Institute of Chemical Industry Company Limited (SWRDICI) was one of the key R&D institutes directly under the former Ministry of Chemical Industry, engaging in R&D, engineering design, project contract and management, technical consultation and service, product production and sale, and technology trade. In 1999, SWRDICI was transformed from a public institution to a high-tech enterprise and, in 2012, to a limited liability company with registered capital of RMB 328.6288 million yuan. Now, it subordinates to China Haohua Chemical Group Co., Ltd., which is a subsidiary of China National Chemical Corp..

SWRDICI is a national level high-tech enterprise, a national intellectual property demonstration enterprise and a national innovation pilot enterprise, and has passed the certification of ISO9001 Quality System, ISO14001 Environmental Management System and OHSAS18001 Occupational Safety and Health Management System.

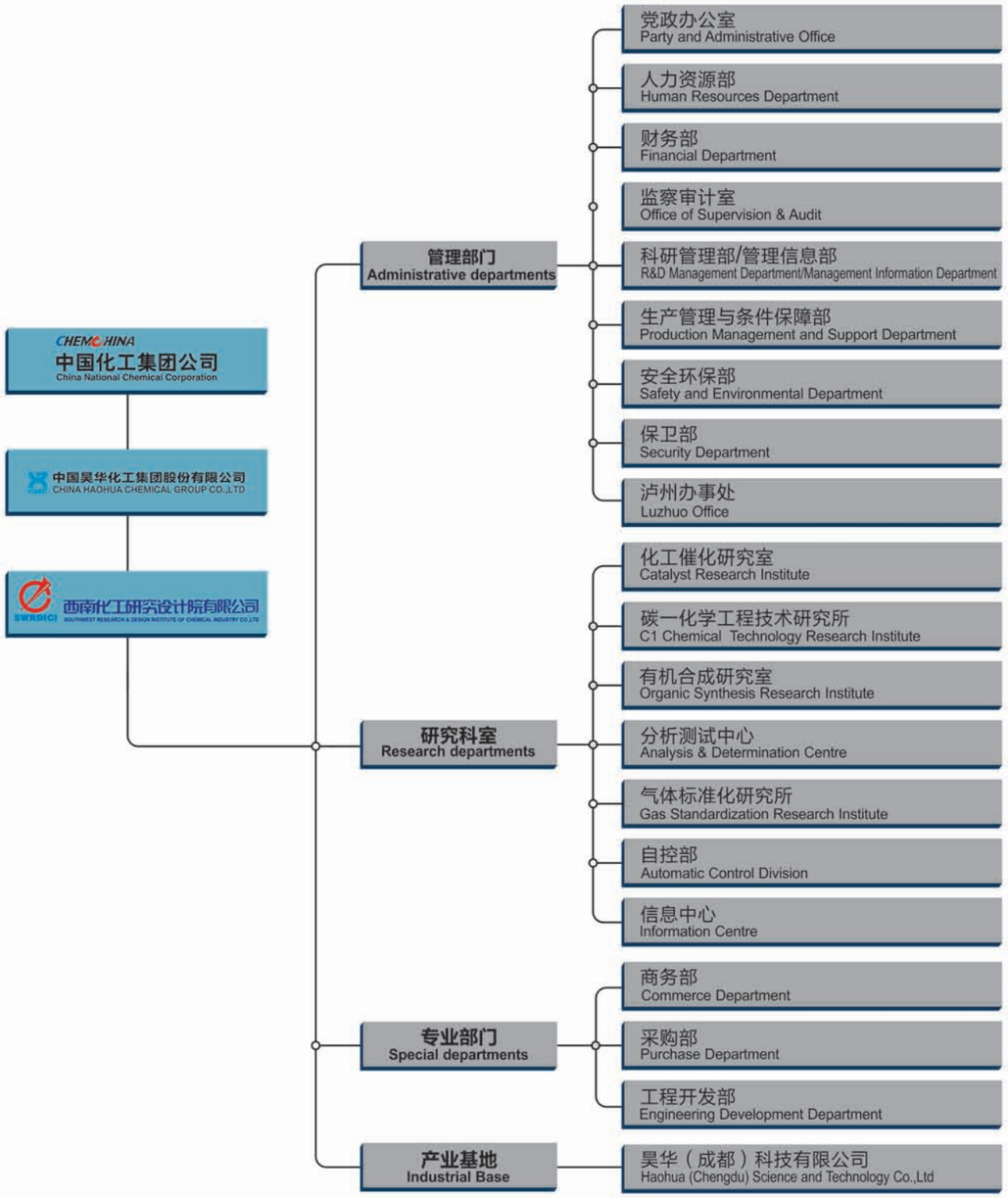
SWRDICI has long been engaging in R&D in the areas of natural gas-based chemicals, coal-based chemicals, C1 chemicals, industrial vent gas purification and reuse, new energy and energy saving technology, environmental technology and equipment, special gases and standard gases, automatic control systems and special catalysts, as well as in engineering development, technology transfer and product manufacture. SWRDICI always adheres to the development idea of "guided by technological innovation focusing on industrial application and aiming to leading and driving the progress of industrial technology" with developing the key technologies and generic technologies applied in the critical sectors of China such as resource, energy source and environment as its mission, and has constructed a prefect technological innovation and service system.

In recent years, depending on the state-level technological innovation platforms such as "State Key Laboratory of Industrial Vent Gas Reuse", "National Engineering Research Centre for C1 Chemistry", "National Center of PSA Separation Engineering Research & Popularization" and "National Technical Committee 206 on Gas of Standardization Administration of China", SWRDICI has undertaken a number of projects supported by National Key Technologies R&D Program, National Basic Research Program of China (973 Program), National High-tech R&D Program (863 Program), and State Transformation Program of Major Scientific and Technological Achievements, etc., such as Development of Key Technologies for Preparing Bulk Chemicals Through Non-Petrochemical Route, Applied Basic Research on Cyclic Utilization of Spent Ore Resources, Key Technologies for Converting CO_2 to Natural Gas and Production of Natural Gas by Methanation of Coke Oven Gas. SWRDICI owns leading technologies in China in the following fields: coke oven gas methanation to synthetic natural gas (SNG), methanol carbonylation to acetic acid, methanol to dimethyl ether, methanol decomposition to H_2, crude benzene hydrogenation refining, N-formylmorpholine production from morpholine and methyl formate, low- or medium- pressure methanol synthesis from syngas or carbon dioxide and proprietary catalysts, reforming and pre-reforming catalysts for gaseous and liquid hydrocarbons like methane and naphtha, etc. In addition, the industrialization of some new technologies, which include the production of natural gas by methanation of coke oven gas supplemented CO_2,the reuse of calcium carbide furnace tail gas, the purification of yellow phosphorus tail gas, the industrial vent gas to ethylene glycol, the acetic acid hydrogenation to ethanol, the coal to SNG, etc. indicates that a number of advanced proprietary technologies for production of coal-based chemicals and C1 chemicals, purification and reuse of industrial vent gases, etc., have come into being, and these technologies have been or will soon be used widely in various industrial fields including chemical, petrochemical, petroleum, coking, metalluygy, energy, etc.

SWRDICI has accomplished more than 700 research projects, among which, more than 100 items had won state-level or provincial/ministry-level science and technology awards, including two first prizes of State Scientific and Technological Progress Prize. It has applied for 269 patents (including 233 patents for invention), and 148 patents (including 115 patents for invention) have been granted. In addition, it has established and revised more than 130 national standards for gases.

Haohua (Chengdu) Technology Co., Ltd., a subsidiary invested by SWRDICI, is located in Sichuan Xinjin Industrial Park. The company has a planned area of 1400 mu (1 mu=667 m^2), of which Phase I covers an area of 500mu. The company is mainly engaged in design and manufacturing of Class I, II and III pressure vessels and the production, sale and after-sale services of the novel catalysts for methanation, dimethyl ether synthesis, methanol synthesis and methanol decomposition to hydrogen and the N-formyl morpholine product.

组织体系
ORGANIZATION SYSTEM



国家级中心
NATIONAL-LEVEL CENTRES

- 工业排放气综合利用国家重点实验室
  State Key Laboratory of Industrial Vent Gas Reuse
- 国家碳一化学工程技术研究中心
  National Engineering Research Centre for C1 Chemistry
- 国家变压吸附气体分离技术研究推广中心
  National Centre of PSA Separation Engineering Research & Popularization
- 水煤浆汽化及煤化工国家工程研究中心含氧化学部
  Oxygenated Chemicals Section of the National Engineering Research Centre for Coal Water Slurry Gasification and Coal Chemicals
- 全国气体标准化技术委员会
  National Technical Committee 206 on Gas of Standardization Administration of China
- 全国半导体材料和设备标准化技术委员会气体分会
  Subcommittee 1 on Gas of National Technical Committee 203 on Semiconductor Material and Equipment of Standardization Administration of China
- 全国标准样品技术委员会气体标准工作组
  Working Group 6 on Gas Reference Material of National Technical Committee 118 on Reference Material of Standardization Administration of China
- 全国煤化工标准化技术委员会煤制化学品分会
  Subcommittee 2 on Chemical Products of National Technical Committee 469 on Coal Chemical Industry of Standardization Administration of China
- 天然气化工专业委员会
  Natural Gas Chemical Industry Committee
- 全国天然气化工与碳一化工信息中心
  National Information Centre for Natural Gas Chemical Industry and C1 Chemical Industry
- 《天然气化工》杂志（全国核心期刊）
  Natural Gas Chemical Industry (core journal of China)
- 中国气体标准网
  Website of China Gas Standardization (www.qbw.org.cn)
- 国家碳一化学工程技术研究中心网
  Website of National C1 Chemistry Research Centre (www.c1centre.com)
- 全国天然气化工与碳一化工信息中心变压吸附网
  PSA Network of National Information Centre for Natural Gas Chemical Industry and C1 Chemical Industry

领导关怀
LEADERS' SUPPORTS AND CONCERNS

西南院发展至今一直受到国家、各部委及地方政府的大力支持及关怀，许多领导同志亲临视察指导工作。

In the development process of SWRDICI, it has always been strongly supported and concerned by the central and local governments. Many leaders visited SWRDICI and gave instructions.

掌握綜合利用天然氣的最新技術為祖國社會主義建設服務

朱德 九六三年

1963年朱德委员长来院视察

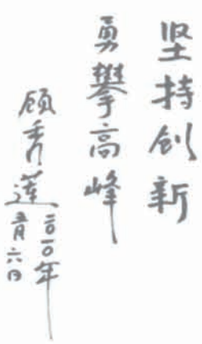
Zhu De, chairman of the Standing Committee of the National People's Congress, visited SWRDICI in 1963.

1993年化工部贺国强副部长来院参观

He Guoqiang, vice minister of the Ministry of Chemical Industry, visited SWRDICI in 1993.

2010年第十届全国人大常委会副委员长、原化工部部长顾秀莲视察我院

Gu Xiulian, vice chairman of the Standing Committee of the 10th National People's Congress and minister of former Ministry of Chemical Industry, visited SWRDICI in 2010.



坚持创新 勇攀高峰

顾秀莲 二〇一〇年 青六月

2005年科技部党组书记李学勇来院考察

Li Xueyong, secretary of the Communist Party Leadership Group of the Ministry of Science and Technology, visited SWRDICI in 2005.

2008年“5.12”大地震后中国化工集团公司任建新总经理等领导同志来院慰问

Ren Jianxing, general manager of China National Chemical Corporation, and other leaders visited SWRDICI after Wenchuan earthquake on May 12, 2008.

2013年中国昊华化工集团股份有限公司总经理、党委书记胡冬晨来院新津产业基地视察

Hu Dongchen, general manager of China Haohua Chemical Group Corporation and secretary of the Communist Party committee, visited the industrial base of SWRDICI at Xinjin in 2013.

资质荣誉
QUALIFICATIONS & HONORS

西南院持有国家有关部门颁发的：

- 企业法人营业执照
- 国家高新技术企业证书
- 工程设计资质证书
- 质量、环境、职业健康认证体系证书
- 特种设备制造许可证书
- 气体产品质量检验证书
- 环境污染防治工程证书
- 国家级科技成果推广计划证书
- 工程咨询单位资格证书

SWRDICI holds the following certificates issued by related authorities:

- Business License of Enterprise Legal Person
- Certificate of State High-tech Enterprise
- Qualification Certificate for Engineering Design
- Certificates of Quality Management System(QMS), Environmental Management System(EMS), Occupational Health & Safety Management System(OHSMS)
- Manufacture License of Special Equipment
- Quality Inspection Certificate of Gas Product
- Certificate of Environmental Pollution Control and Treatment Engineering
- Certificate for Popularization Plan of National Scientific and Technological Achievements
- Qualification Certification of Engineering Consultation Unit

先后荣获：

- 国家科技进步一等奖2项
- 第三届爱因斯坦世界发明博览会金奖
- 四川省科技进步特等奖
- 国家优秀工程设计奖
- 全国化工行业优秀工程设计一等奖
- 中央企业先进集体
- “十一五”国家科技计划执行优秀团队
- 科技创新先进单位

Awards:

- Two First Prizes of National Science and Technology Progress Award
- Gold Prize in the Third Einstein World Invention New Technology Exibition
- Special Prize of Sichuan Provincial Science and Technology Progress Award
- Prize of National Excellent Engineering Design
- First Prize of National Chemical Industry Excellent Engineering Design
- Advanced Unit in Central Enterprises
- The excellent executive team of "Eleventh Five-Year" National Science and Technology Plan
- Advanced Scientific and Technological Innovation Unit

以人为本 务实创新
Human-orientation, pragmatic innovation

服务范围
BUSINESS SCOPE

西南院以“开拓创新、建设平台、带动行业、做强产业”为指导方针，不断增强科技服务能力，致力于科技成果转化，大力推进科技进步。随着经济业务的发展，科研服务范围和领域不断拓展。

With "developing and innovating, establishing platform, mobilizing sector and strengthening industry" as guidelines, SWRDICI continuously strengthens its capability in science and technology service, dedicates to transfer of scientific and technological achievements and, vigorously promotes scientific and technological progress. With the development of economy and business, SWRDICI has been expanding its business scopes and fields continuously.

• 科研及技术开发	Research and development
• 成果转让及技术服务	Technology transfer and technical services
• 承接、委托和合作研发	Undertaking, commissioning and cooperative R&D
• 技术咨询	Technical consultation services
• 产业发展规划	Industry development planning
• 工程设计及承包	Engineering design and contracting
• 技术培训	Technical training
• 项目建设管理	Project construction management
• 化工产品生产与销售	Production and sale of chemical products
• 机械设备生产和销售	Production and sale of mechanical equipment

研发领域
R&D FIELDS

天然气化工：开展了天然气净化、转化及合成甲醇下游产品、天然气制氢及合成天然气技术开发。

煤化工：开展煤气化合成大宗化学品（如煤制甲醇、二甲醚、醋酸、乙醇、乙二醇等）、煤制甲烷（合成天然气）等技术开发。

碳一化工：开展了合成气制备与合成甲醇下游产品（如二甲醚、醋酸、乙醇、低碳烯烃等）、合成天然气、合成乙二醇等技术开发。

精细化工：主要研发并生产催化剂、专用化学品、助剂、溶剂等精细化学品。

节能、环保：开展化工过程节能技术、清洁生产技术开发。

工业排放气综合利用：开展焦炉煤气、电石炉尾气、黄磷尾气、煤矿瓦斯等工业排放气的资源化利用技术开发。

催化剂研制与测试：重点开展镍系、铜系、锰系、贵金属系、氧化铝系、分子筛等催化剂研究。

标准气体与特种气体：研究、配制、销售各类标准气体与特种气体。拥有相关的国家级标准物质证书。

分析测试与专用分析仪：生产通用型气相色谱、硫分析仪、特种气体分析仪等仪器设备。

自动控制与仪表：在化工、环保等领域从事自控设计、工业组态、控制优化等服务。

压力容器设计与制造：具备压力容器与压力管道设计与制造甲级资质，设计与制造化工反应器、换热设备、分离设备等。

Natural gas chemical industry: Technologies for natural gas purification, reforming, synthesis of methanol and its downstream products, hydrogen production, etc. In recent years, developing the technology for production of synthetic natural gas (SNG).

Coal chemical industry: Technologies for synthesis of bulk chemicals from coal-based syngas, e.g. methanol, dimethyl ether, acetic acid, ethanol, ethylene glycol, synthetic natural gas (SNG).

C1 chemicals: Technologies for production of syngas, synthesis of methanol downstream products (e.g. dimethyl ether, acetic acid, ethanol and light olefins), synthesis of natural gas, synthesis of ethylene glycol, etc.

Fine chemicals: R&D and production of fine chemicals such as catalysts, special chemicals, additives and solvents.

Energy saving and environmental protection: Development of technologies for energy saving in chemical process and cleaner production.

Industrial vent gas reuse: Development of technologies for resource utilization of industrial vent gases such as coke oven gas, calcium carbide furnace tail gas, yellow phosphorus tail gas and coal-mine gas.

Development and test of catalysts: Focusing on R&D of Ni-based, Cu-based, Mn-based, noble metal-based, Al_2O_3-based and zeolite-based catalysts.

Standard gases and special gases: Engaging in research, preparation and marketing of various standard gases and special gases. It has relevant national-level reference material certificates.

Analysis and test as well as special-purpose analyzers: Engaging in production of instruments and equipment such as universal gas chromatographs, sulfur analyzers and special gas analyzers.

Automation and instrumentation: Engaging in automatic control design, industry configuration and control optimization in chemical and environmental protection industries.

Design and manufacture of pressure vessels: SWRDICI has Class A qualification for design and manufacture of pressure vessels and pressure pipelines as well as chemical reactors, heat exchangers, separation equipment, etc.

新技术成果
NEW TECHNOLOGICAL ACHIEVEMENTS

可提供的主要新技术成果
Major new technological achievements that can be provided

序号 S/N	名称 Name
1	焦炉气甲烷化制合成天然气（SNG）、压缩天然气（CNG）或液化天然气（LNG）技术 Technology for producing synthetic natural gas (SNG), compressed natural gas (CNG) or liquefied natural gas (LNG) through methanation of coke oven gas
2	工业排放气制乙二醇技术 Technology for producing ethylene glycol from industrial vent gas
3	醋酸加氢制乙醇技术 Technology for producing ethanol by hydrogenation of acetic acid
4	电石炉尾气综合利用技术 Technology for comprehensively utilizing tail gas of calcium carbide furnace
5	甲醇制烯烃技术 Technology for methanol to olefins
6	乙醇制乙烯技术 Technology for production of ethylene from ethanol
7	煤制天然气甲烷化技术 Methanation technology for coal to synthetic natural gas
8	烟气脱硝技术 Technology for denitration of flue gas
9	兰炭尾气净化与利用技术 Technology for purification and utilization of semi-coke tail gas
10	黄磷尾气深度净化与资源化利用技术 Technology for deep purification and reutilization of tail gas from yellow phosphorus production
11	煤矿瓦斯分离富集制天然气技术 Technology for producing natural gas through separation and enrichment of coal-mine gas
12	煤矿瓦斯制甲醇技术 Technology for producing methanol from coal-mine gas
13	煤矿瓦斯制氢和液氨技术 Technology for producing hydrogen and liquid ammonia from coal-mine gas
14	二氧化碳和氢气合成甲醇技术 Technology for synthesizing methanol from CO_2 and H_2
15	壬烯羰基合成C10叔碳酸技术 Technology for synthesizing neo-decanoic acid by carbonylation of nonene
16	叔碳酸乙烯酯制备技术 Technology for preparing vinyl versatate (vinyl neodecanoate)

研发力量
R&D TEAM AND CAPABILITY

西南院拥有一支造诣深厚、经验丰富、务实创新的高素质研发队伍。目前，有享受国家政府特殊津贴24人，四川省学术带头人及后备人选10余人，具有专业技术职务的占在岗人员85%；具有博士和硕士学位人员占在岗人员的21%、本科学历占在岗人员的45%，合理的人才结构为科技创新提供了有力的人力支撑。

具有较完善的人才引进、人才培养及技术创新激励机制。

数十年形成的较完善的科研体系、科研装备、科研条件、配套的生产设施，工程开发能力强。

SWRDICI owns a well-qualified R&D team that is pragmatic and innovative, with profound attainments and rich experiences. At present, 24 persons are entitled to special allowances granted by the State Council and 10 persons are academic leaders and candidates of Sichuan province. Those taking professional technical position are 85% of on-the-job personnel, those with PhD and master degree are 21% and those with bachelor degree are 45%. Reasonable structure of talents strongly supports scientific and technological innovation in terms of human resources.

It also has a relatively perfect incentive mechanism for talent introduction, talent cultivation and technological innovation.

Through several decades development, SWRDICI has owned a rather perfect R&D system with better research equipment, research conditions, auxiliary production facilities and engineering development capability.

以人为本 务实创新
Human-orientation, pragmatic innovation

科技创新平台
TECHNOLOGICAL INNOVATION PLATFORMS

工业排放气综合利用国家重点实验室

工业排放气综合利用国家重点实验室，是2008年获科技部批准、依托转制院所和企业组建的全国首批36个国家重点实验室之一。主要针对我国能源、资源、环境和流程工业绿色化重要领域中支撑产业发展的重大需求，以工业排放气分离、净化与综合利用为主要研究对象，开展应用基础研究、综合利用研究和工程开发的研究。

近几年，承担了国家973计划、863计划、技术开发专项、四川省应用基础研究、四川省科技支撑计划等项目，已申请发明专利75项，在焦炉气、煤层气、电石炉尾气、黄磷尾气、兰炭尾气等工业排放气资源化利用方面取得丰硕成果，其中，焦炉气甲烷化制天然气技术已成功转让山西国新正泰新能源有限公司、河北裕泰集团公司、山西阳光焦化股份公司等10多家企业，工业排放气制乙二醇成功转让河北辛集化工集团公司。

SKL 国家重点实验室 STATE KEY LABORATORY

State Key Laboratory of Industrial Vent Gas Reuse

As one of the first 36 state-level key laboratories based on transformed institutes and enterprises, the State Key Laboratory of Industrial Vent Gas Reuse was founded with approval of the Ministry of Science and Technology in 2008. With separation, purification and comprehensive utilization of industrial vent gas as main objects of study, the Laboratory carries out the applied basic research, comprehensive utilization research and engineering development research mainly for the great demands of supporting Chinese industrial development in the critical fields such as energy sources, resources, environment and green chemical process industry.

In recent years, the Laboratory has undertaken a number of projects sponsored by 973 Program, 863 Program, Special Program for Technology Development, Applied Basic Research in Sichuan, and Sichuan Science and Technology Support Program, applied for 75 invention patents, and obtained some great achievements in reutilization of industrial vent gases such as coke oven gas, coal mine methane, calcium carbide furnace gas, yellow phosphorus tail gas and semi-coke tail gas. Among which, the technology for producing synthetic natural gas by methanation of coke oven gas has been licensed to more than 10 companies, including Shanxi Provincial Guoxin Zhengtai New Energy Source Co., Ltd., Hebei Yutai Group, Shanxi Sunlight Coking Group Holding Co., Ltd., etc. The technology for producing ethylene glycol from industrial vent gases has been licensed to Hebei Xinji Chemical Group Co., Ltd.

国家碳一化学工程技术研究中心

国家碳一化学工程技术研究中心于1993年组建，1996年通过科技部验收；中期运行评估两次获得“优秀”,2011年被科技部评为“十一五”国家科技计划执行优秀团队；形成了工程化成果辐射广、开发服务与人才培养好、行业地位和作用十分显著的良性运行机制。

主要从事烃类转化制合成工艺与催化剂、碳一化学品合成工艺与催化剂、含碳废气资源化利用技术的工程技术与应用研究开发。承担了国家、省部级及其它重点科研项目100余项，取得科研成果70余项。甲醇羰基合成醋酸、甲醇制二甲醚、甲醇裂解制氢、中低压合成甲醇、焦炉气制天然气等众多工业化成果得到广泛应用。

National Engineering Research Centre for C1 Chemistry

The National Engineering Research Centre for C1 Chemistry was founded in 1993 and accepted by the Ministry of Science and Technology in 1996. It was evaluated as "excellent" twice in the interim operational evaluation and evaluated as the excellent executive team of “Eleventh Five-Year" National Science and Technology Plan by the Ministry of Science and Technology in 2011. A benign operation mechanism has been formed with wide range of engineering achievements, good R&D services and talent cultivation as well as significant position and role in engaging industry.

It is mainly engaged in engineering technology development and application research of the processes and catalysts for reforming of hydrocarbons like natural gas to syngas, the processes and catalysts for synthesis of C1 chemicals, and reutilization of carbonic emissions. It has undertaken over 100 state-level and provincial/ministry-level and other key research projects and obtained more than 70 research achievements. Many industrial achievements have been widely used, such as the technologies for synthesizing acetic acid by carbonylation of methanol, producing dimethyl ether from methanol, producing hydrogen by methanol decomposition, medium- and low-pressure methanol synthesis and producing synthetic natural gas from coke oven gas.

气标委、电子气标委分会、气体标准工作组及煤化工标委分会

主要从事全国气体标准化的技术组织工作，负责化工气体技术领域的标准化技术归口管理工作，负责煤基化学品、煤化工产品检测等的国家标准制修订，从事气体分析设备的研制、气体标样配气装置的推广、气体标准样品的配制、气体净化设备的销售、气体厂设计、特气销售、技术培训等。

标委会累计制修定国家气体标准近130项，行业标准40多项，还承担了国际标准化组织气体分析技术委员会P成员的相关工作及国家公益性标准研究项目，为我国规范气体市场，提高气体产品质量，促进与国际接轨起到积极的推动作用。

National TC 206 on Gases of SAC, Subcommittee 1 on Gas of National TC 203 on Semiconductor Material and Equipment of SAC, Working Group 6 on Gas Reference Material of National TC 118 on Reference Material of SAC and Subcommittee 2 on Chemical Products of National Technical Committee 469 on Coal Chemical Industry of SAC

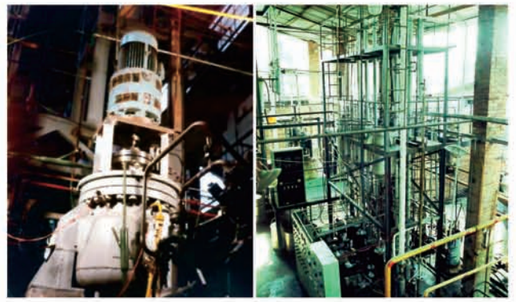
These SAC's branches are mainly engaged in the technical organization of standardization for gases nationwide, responsible for the centralized management of standardization technologies in the field of chemical gases, the establishment and revision of national standards for coal-based chemicals, coal chemical products test, etc.. They also works in R&D of gas analyzer, popularization of standard sample gas distributor, preparation of standard sample gases, sale of gas purifier, design of gas plant, sale of special gases, technical training, etc.

They have accumulatively established and revised nearly 130 state-level gas standards and more than 40 trade standards. Meanwhile, they also undertake the works to be performed by the members of Subcommittee 1 on Gas Analysis of National Technical Committee 206 on Gases of SAC and the state-level non-profit standard research programs, playing a positive role in regulating gas market, improving gas product quality and acting on international convention.

实验装备
EXPERIMENTAL SETS

西南院拥有较配套完备的中试基地，对实验室成果进行中间放大验证，为工业化装置设计提供依据。

SWRDICI has a pilot base with comprehensive facilities for verifying the laboratory techniques through scale-up pilot test, providing necessary basic data for industrial design.



70、80年代醋酸小试装置
Laboratory and bench apparatus for acetic acid synthesis in 1970s and 1980s

90年代甲醇制二甲醚中试装置
Pilot plant for dehydration of methanol to dimethyl ether in 1990s

近年草酸酯加氢制乙二醇中试装置
Pilot plant for producing ethylene glycol via catalytic hydrogenation of oxalic ester in recent years

近年焦炉气甲烷化中试装置
Pilot plant for methanation of coke oven gas in recent years

近年醋酸加氢制乙醇中试装置
Pilot plant for production of ethanol by hydrogenation of acetic ester

专利及专有技术
PATENTS AND PROPRIETARY TECHNIQUES

西南院成立至今，拥有专利及专有技术370余项。发明专利占专利申请总量的86%以上，专利成果转化率达到80%。

Up to now, SWRDICI has possessed more than 370 patents and proprietary technologies. among which the invention patents occupied more than 86% and the ratio of implemented patents reached 80%.

- 国家级知识产权示范企业
- 全国创新型试点企业
- 国家专利运营试点企业
- 中国专利优秀奖
- 全国专利工作先进单位
- 四川省知识产权示范企业
- 四川省第二批企业知识产权试点示范工作先进单位
- 中国化工专利工作先进企业
- 成都市专利金奖

- National intellectual property demonstration enterprise
- National innovative pilot enterprise
- National Pilot Enterprise for Patent Operation
- Chinese Patent Award of Excellence
- National Advanced Patent Unit
- Sichuan Provincial Demonstration Enterprise of Intellectual Property
- The Second Batch of Advanced Units for Pilot and Demonstration of Intellectual Property in Sichuan
- Advanced Enterprise for Chemical Patent in China
- Chengdu Gold Prize for Patent

工程开发与设计
ENGINEERING DEVELOPMENT AND DESIGN

我院除具有强劲的创新研发能力外，还具有良好的工程开发与设计能力，众多科技成果在促进行业技术进步，提升企业效益等方面发挥着支撑及引领作用。

In addition to strong innovation and R&D capabilities, SWRDICI also has excellent capabilities in engineering development and design. Numerous advanced technologies plays a supporting and leading role in promoting industrial technological progress and improving enterprise benefit.

焦炉气甲烷化制合成天然气（SNG）、压缩天然气（CNG）或液化天然气（LNG）技术

焦炉气甲烷化制天然气是西南院承担的国家863计划项目，开发了具有自主知识产权的“焦炉气甲烷化制合成天然气集成工艺技术及甲烷化专用催化剂”。该成果于2010年通过四川省科技厅组织的鉴定。

至今，已为河北裕泰集团有限公司、山西国新正泰新能源有限公司、山西襄矿集团、河北迁安市九江煤炭储运有限公司等10余家企业提供了焦炉气甲烷化制天然气工业开发技术。其中，河北裕泰集团有限公司30000Nm^3/h焦炉气甲烷化制压缩天然气装置已于2013年12月建成投产。河北迁安市九江煤炭储运有限公司采用西南院技术建设的8亿方/年焦炉气制液化天然气(LNG)项目，是全球最大的焦炉气制液化天然气的工业装置。

河北裕泰集团有限公司（30000Nm^3/h）焦炉气制压缩天然气(CNG)工业装置
Plant for producing compressed natural gas (CNG) from 30000Nm^3/h coke oven gas in Hebei Yutai Group Co.,Ltd

中石油华油天然气股份公司
焦炉煤气制天然气（PMC）工业装置
Coke oven gas to SNG for CNPC Huayou Natural Gas Co., Ltd. (PMC project)

Technology for producing synthetic natural gas (SNG), compressed natural gas (CNG) or liquefied natural gas (LNG) by methanation of coke oven gas

SWRDICI undertook the research of producing natural gas by methanation of coke oven gas, which funded by 863 Program and resulted in development of "technology for producing synthetic natural gas by methanation of coke oven gas and special catalyst for methanation" with proprietary intellectual property rights. It passed the appraisal of Science & Technology Department of Sichuan Province in 2010.

Up to now, it has been licensed to more than 10 companies, including Hebei Yutai Group, Guoxin Zhengtai New Energy Source Co., Ltd., Xuanyuan Coal Mine Company, Hebei Jiujiang Coal Storage & Transportation Co., Ltd., etc. Among them, the plant for production of compressed natural gas by methanation of 30000Nm^3/h coke oven gas in Hebei Yutai has been put into operation in December, 2013, and the project of Hebei Jiujiang will produce liquefied natural gas (LNG) from 800,000,000Nm^3/a coke oven gas, which will be the largest industrial plant for producing LNG from coke oven gas worldwide.

山西国新正泰新能源有限公司（30000Nm^3/h）焦炉气制合成天然气(SNG)工业装置
Plant for producing synthetic natural gas (SNG) from 30000Nm^3/h coke oven gas in Guoxin Zhengtai New Energy Source Co., Ltd.

工业排放气制乙二醇技术

西南院承担的国家“十一五”科技支撑计划 “草酸酯加氢制乙二醇催化剂及工艺开发”课题任务，现已成功开发出具有自主知识产权的Pd系CO偶联催化剂和Cu基加氢催化剂及其配套工艺。该成果于2011年通过四川省科技厅组织的鉴定。

目前，已与河北辛集化工集团公司签订了6万吨/年工业排放气制乙二醇技术许可合同，正在开展产业化示范。

Technology for producing ethylene glycol from industrial vent gases

SWRDICI has undertaken the task in the "Eleventh Five-Year" National Key Technologies R&D Program--the Catalyst and Process for the Production of Ethylene Glycol by Hydrogenation of Oxalic Ester, and succeeded in developing a novel Pd catalyst and process for CO coupling and a novel Cu-based catalyst and process for hydrogenation of oxalic ester with proprietary intellectual property rights. The technology passed the appraisal of Science & Technology Department of Sichuan Province in 2011.

SWRDICI has signed a licensing contract for the production of 60kt/a ethylene glycol from industrial vent gas with Hebei Xinji Chemical Group Co., Ltd. The technology will be demonstrated in a commercial scale unit before long.

电石炉尾气深度净化综合利用技术

西南院承担的国家973计划“电石炉尾气净化与天然气高效开采应用基础研究”课题，已成功开发了电石炉尾气深度净化提纯制CO成套技术。该技术适用于高含硫电石炉尾气的净化与提纯，能满足羰基合成对一氧化碳原料气的要求。

已在宁夏国电英力特能源化工集团公司建成250 Nm^3/h电石炉尾气净化提纯制CO中试装置，CO产品纯度达到98%以上，通过现场考核验收。

Technology for deep purification and comprehensive utilization of calcium carbide furnace tail gas

SWRDICI has undertaken the topic under the 973 Program--Applied Basic Research on Purification of Calcium Carbide Furnace Tail Gas and Natural Gas Efficient Exploration, and succeeded in developing a complete technology for producing purified CO by deep purification of calcium carbide furnace tail gas. The technology is applicable to the purification of high-sulfur calcium carbide furnace tail gas and the purified CO product gas can use as the feedstock for carbonylation procedures.

A pilot plant for purification of 250 Nm^3/h calcium carbide furnace tail gas has been built in Guodian Younglight Energy Chemical Group Co., Ltd., and the purity of CO product gas could reach to more than 98%. The plant passed the examination and acceptance on site.

宁夏国电英力特电石炉尾气工业装置
Pilot plant for comprehensive utilization of calcium carbide furnace tail gas in Guodian Younglight Energy Chemical Group Co., Ltd.

醋酸加氢制乙醇技术

西南院承担的国家技术开发专项“醋酸加氢制乙醇技术”项目，已开发出“合成气→甲醇→醋酸→乙醇”成套自主知识产权技术，2012年通过四川省科技厅组织的鉴定。该技术不仅可替代高成本粮食发酵法乙醇合成路线，还能延伸产业链，解决醋酸产能过剩以及企业副产醋酸酯（如聚乙烯醇行业）的循环利用问题，与传统的发酵法相比有竞争力，对于自产醋酸以及有氢气来源的企业更具优势。

西南院与河南顺达化工科技有限公司签订了全球首套“醋酸酯化加氢20万吨/年制乙醇”技术许可合同，正在进行工业化应用。

Technology for producing ethanol by hydrogenation of acetic acid

SWRDICI has undertaken the National Science and Technology Major Project-Production of Ethanol by Hydrogenation of Acetic Acid, and succeeded in developing a complete technology for the "syngas→methanol→acetic acid→ethanol" with proprietary intellectual property rights. The technology passed the appraisal of Science & Technology Department of Sichuan Province in 2012. It can not only replace the costly corn-and sugar-based ethanol synthesis technologies with fermentation method, but also expand industrial chain and solve the problems of excess acetic acid production capacity and cyclic utilization of by-product acetic ester from, as a example, polyvinyl alcohol industry. Compared with traditional fermentation method, the technologies are more competitive. For the companies who produce acetic acid and have hydrogen source, it is more advantageous.

SWRDICI has signed a licensing contract with Henan Shunda Science and Technology Co., Ltd. to use the acetic acid esterification and hydrogenation technologies to build the first commercial ethanol plant of 200kt/a in the world. Now, the project is being implemented.

自动化工程

西南院从事工业生产装置的自动化和仪器、仪表系统的开发应用，以及环保技术工程开发。可根据用户需求制定DCS集散控制系统的技术方案、工程设计、系统集成及现场调试服务。可承接环保工程总包业务。

Automation engineering

SWRDICI is engaging in development and application of the automatic control and instrument systems for industrial production plants and engineering development of environmental protection technologies. It is allowed to prepare technical proposal, engineering design, system integration and field debugging of distributed control system (DCS) according to users' demands. It also takes environmental protection EPC projects.

四川路加四通科技发展有限公司DCS系统
DCS for Sichuan Lujia Sitong Technology Development Co., Ltd.

甘肃银光聚银化工有限公司DCS系统
DCS for yinguang Chemical Industry Co., Ltd.

甲醇制二甲醚技术

西南院是国内最早从事甲醇脱水制二甲醚工艺与专用催化剂研发与生产的企业，于90年代中期率先在广东中山建成我国首套甲醇脱水制二甲醚工业装置。“由甲醇生产二甲醚的方法”发明专利荣获2009年中国专利优秀奖。CNM-3二甲醚催化剂被评为国家重点新产品。

至今，已为湖北天茂实业集团公司、山东玉皇化工公司等70余家企业提供5～30万吨/年甲醇制二甲醚工业化应用技术（含国外装置）。

Technology for producing dimethyl ether from methanol

SWRDICI is the earliest in China to develop process and special catalyst for producing dimethyl ether by dehydration of methanol. The first production plant of dimethyl ether in China was built in Zhongshan, Guangdong in 1990s based on SWRDICI's technology. The invention patent-Method of Producing Dimethyl Ether from Methanol won the award of excellent patent of China in 2009. Dimethyl ether synthesis catalyst CNM-3 was rated as the national key new product.

Up to now, more than 70 dimethyl ether production plants with the capacity of 50,000 to 300,000 tons per year have been built in China and other countries based on SWRDICI's technology, such as the plants in Tianmao Industrial Group Co., Ltd. and Shandong Yuhuang (Group) Co., Ltd.

张家港新奥燃气公司30万吨/年二甲醚工业装置
200kt/a dimethyl ether plant in Zhangjiagang Gas Company

湖北天茂实业集团股份有限公司30万吨/年产二甲醚工业装置
300kt/.a dimethyl ether plant in Tianmao Industrial Group Co., Ltd.

河南神马尼龙公司4000m^3/h甲醇制氢工业装置
4000m^3/h methanol-to-hydrogen plant in Henan Shenma Nylon Chemical Co., Ltd.

东北制药厂1000Nm^3/h甲醇制氢装置
1000m^3/h methanol-to-hydrogen plant in Dongbei Pharmaceutical Factory

甲醇裂解制氢技术

西南院于90年代研究开发出甲醇裂解制氢工艺及催化剂，在广州金珠江化学有限公司建成国内首套工业化装置。该工艺采用高效的甲醇裂解制氢催化剂及先进的变压吸附气体分离技术，可制得99.9～99.999%氢气和食品级二氧化碳。

至今，已为唐山旭阳化工有限公司、上海BOC气体公司等70余家企业提供了甲醇裂解制氢工业化应用技术。

Technology for producing hydrogen by methanol decomposition

In 1990s, SWRDICI researched and developed the process and catalyst for producing hydrogen by methanol decomposition. The first commercial plant using this technology in China was built in Guangzhou Jinzhujiang Chemical Corporation. A highly efficient catalyst for methanol decomposition and the gas separation technology of pressure swing absorption were used in this process, and 99.9%~99.999% hydrogen and food grade carbon dioxide could be produced by it.

Up to now, it has been licensed to more than 70 companies, including Tangshan Xuyang Chemical Co., Ltd., Shanghai BOC Industrial Gas Co., Ltd., etc.

中低压合成甲醇技术

西南院是“全国低压合成甲醇工艺及催化剂”技术依托单位，于90年代建成国内首套以天然气为原料的万吨级甲醇工业装置。

至今，已为陕西榆林天然气化工厂等30余家企业提供了中低压合成甲醇工业化应用技术。

2006年，西南院牵头承担了“十一五”国家科技支撑计划项目“百万吨级大型化合成甲醇反应器及催化剂研究”、“二氧化碳和氢气合成甲醇催化剂及工艺研究”任务，形成了具有自主知识产权的大型化合成甲醇技术。

Technology for medium- and low-pressure methanol synthesis

As a state-level technical supporting unit for "process and catalyst for low-pressure methanol synthesis", SWRDICI provided its technology for the first natural gas-based methanol facility in China with the capacity of more than 10 thousand tons annually in 1990s.

Up to now, it has been licensed to more than 30 companies, including Shaanxi Yulin Natural Gas Chemical Industry Co., Ltd. (YUTIAN HUA), etc.

In 2006, SWRDICI took the lead in undertaking "research on megaton reactor and catalyst for methanol synthesis" and "research on catalyst and process for methanol synthesis from carbon dioxide and hydrogen" under National Key Technologies R&D Program of the Eleventh Five-Year Plan, resulting in the large-scale methanol synthesis technology with proprietary intellectual property right.

榆林天然气化工厂甲醇工业装置（首套国产化万吨级装置）
Methanol plant in YUTIAN HUA -first natural gas-based methanol facility in China with the capacity of more than 10 thousand tons annually

锦西天然气化工公司3万吨/年合成氨联产甲醇装置
30kt/a methanol plant combining with ammonia synthesis system in Jinxi Natural Gas Chemical Co., Ltd.

河南顺达科技公司20万吨/年醋酸工业装置
200kt/a acetic acid plant in Henan Shunda Science and Technology Co., Ltd.

甲醇羰基合成醋酸技术

西南院从20世纪70年代起开始进行甲醇低压羰基合成醋酸技术的研发，90年代完成了国家“八五”攻关项目的醋酸中试装置设计，开发出了具有我国自主知识产权“甲醇低压液相羰基合成醋酸反应方法”等专利技术。

2005年，首套20万吨/年甲醇低压羰基合成醋酸装置在山东兖矿集团建成并投产。至今，已为兖矿集团、云维集团等8家企业提供了20万吨/年甲醇羰基化制醋酸工业化应用技术。

2008年西南院与美国塞拉尼斯公司签订醋酸专利技术许可合同。

Technology for synthesizing acetic acid by carbonylation of methanol

Since 1970s, SWRDICI has started R&D of the technology for synthesizing acetic acid by low-pressure carbonylation of methanol. In 1990s, the design of pilot plant for acetic acid synthesis-a project of the 8th Five-Year Plan National Key Technologies R&D Program was completed, and the patent technology with proprietary intellectual property rights-the Method for Synthesizing Acetic Acid through Low-Pressure Liquid-Phase Carbonylation of Methanol and similar patent technologies were developed.

In 2005, the first plant of 200kt/a for synthesizing acetic acid by low-pressure carbonylation of methanol was built and put into operation in Shandong Yankuang Group. Up to now, this technology has been licensed to eight companies, including Yankuang Group, Yunwei Group, etc.

In 2008, SWRDICI signed an acetic acid patent technology licensing contract with Celanese Corporation.

云维集团20万吨/年醋酸工业装置
200kt/a acetic acid plant in Yunwei Group

交流与合作
COMMUNICATION AND COOPERATION

西南院加强与国际跨国公司、国内企业、高校、科研院所的技术交流与合作，积极探索开放、合作、服务、发展的新路子，寻求共谋发展的新途径。聚集创新资源，推动科技与产业发展的深度融合。

近年来，西南院与美国塞拉尼斯、中海油、国电集团等公司开展产、学、研合作项目近10项。

SWRDICI is willing to strengthen technical communication and cooperation with international corporations, domestic enterprises, universities and research institutes, proactively explore new approaches for opening-up, cooperation, service and development, including joint development. All of the innovation resources will be gathered to deepen the integration of technology and industry. In recent years, SWRDICI has organized and executed nearly 10 collaborative projects together with Celanese Corporation, China National Offshore Oil Corporation, China Guodian Corporation, etc.

中海油气电集团与西南院科研项目合作签约
SWRDICI signed an agreement with CNOOC Gas & Power Group for technical research project collaboration

美国塞拉尼斯公司与西南院签约醋酸专利技术许可及技术合作交流
SWRDICI signed an agreement with Celanese Corporation for acetic acid patent technology licensing and research collaboration

国家科技支撑计划项目验收会
Acceptance meeting for National Key Technologies R&D Program

全国工业排放气综合利用首次学术交流会
The first national academic communication meeting for reuse of industrial vent gases

全国煤化工标委会煤制化学品分会成立大会
Opening ceremony of the Subcommittee 2 on Chemical Products of National Technical Committee 469 on Coal Chemical Industry of Standardization Administration of China

《中国煤化工》技术研讨会
Technical seminar organized by journal of China Coal Chemical Industry

中国国际煤化工发展论坛暨展览会
China international forum and exhibition of coal chemical industry

可提供的产品
PRODUCTS

催化剂类

西南院在化工催化领域具有50多年的专业研究经验，自上世纪60年代开发了烃类转化催化剂、合成甲醇催化剂，达到国内领先水平，其中，“ C302低压合成甲醇催化剂及其工艺技术”荣获第三届爱因斯坦世界发明博览会金奖。科技部批准西南院为 “低压合成甲醇工艺及其催化剂”的技术依托单位。至今，催化剂产品已成功应用于工业及石化行业数百家企业。

近年来，碳一化工、节能环保领域的快速发展，西南院重点开发了二甲醚催化剂、脱氧催化剂、甲烷化催化剂等。

西南院在新津工业园区建设的500吨/年甲烷化催化剂生产线，该催化剂具有抗高烃转化及脱氧的能力，转化率高，耐热性及稳定好等特点，将极大地满足焦炉气甲烷化制天然气工业应用的市场需求。

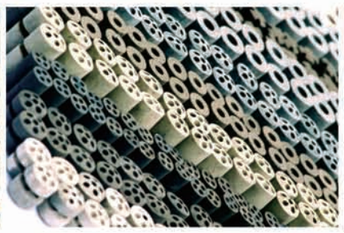

国家重点新产品
证书
项目名称：CNM-3型甲醇脱水制二甲醚催化剂　项目编号：20100870000S
承担单位：西南化工研究设计院　发证时间：二〇一〇年五月
批准机关：科学技术部　有 效 期：三年

Catalysts

SWRDICI has more than 50 years of professional research experience in chemical catalyst field. Since 1960s, it has developed a series of catalysts for reforming of hydrocarbons, methanol synthesis, etc., maintaining a leading position in China. "C302 catalyst and process for low-pressure synthesis of methanol" won gold prize in the Third Einstein World Invention New Technology Exhibition. SWRDICI has been approved by the Ministry of Science and Technology as the technical supporting unit for "process and catalyst for low-pressure synthesis of methanol". Up to now, these catalysts have been applied in industry and hundreds of plants in chemical and petrochemical industries.

In recent years, with the rapid growth in production of ammonia, methanol, coal chemicals, and C1 chemicals and the development of energy conservation and environmental protection industry, SWRDICI focused on developing novel catalysts for dimethyl ether and methanol synthesis, deoxidation, methanation, etc..

SWRDICI has built a 500t/a production line of the methanation catalyst in Xinjin Industrial Park. The catalyst is characterized by capability of high hydrocarbon resistance and deoxidation, high conversion rate, good heat resistance and stability, etc., which can fully satisfy the market demands in production of synthetic natural gas by methanation of coke oven gas.



大庆化肥厂40万吨/年合成氨装置
400kt/a ammonia unit in Daqing Chemical Fertilizer Plant

大庆甲醇厂20万吨/年甲醇装置
200kt/a methanol unit in Daqing Methanol Plant


国家重点新产品
证书
项目名称：N-甲酰吗啉
项目编号：2009GRF00010
承担单位：西南化工研究设计院
发证时间：二〇〇八年十一月
有效期：三年
批准机关：科学技术部


全国加氢苯行业优质辅料（N-甲酰吗啉）
定点生产企业
全国焦化苯（产业链）行业协作组
二零一零年五月

N-甲酰吗啉

西南院于90年代初开展“甲酸甲酯法合成N-甲酰吗啉工艺”技术开发，列入国家“八五”科技攻关项目。1999年N-甲酰吗啉成功应用于石家庄焦化厂5万吨/年焦化苯加氢精制生产装置，替代了进口产品，填补了国内空白。该产品被评为国家重点新产品。

至今，该产品远销伊朗、印度、沙特等国家，应用于燕山石化、上海宝钢等国内外50多套石化与焦化生产装置。

N-formyl morpholine

In the early 1990s, SWRDICI started to develop a technology-Synthesis of N-Formyl Morpholine by the Method Using Methyl Formate as Feedstock, which was listed in the National Key Science and Technology Project during the Eighth Five-year Plan Period. In 1999, the product was firstly applied to a 50kt/a plant for hydrofining of coking benzene in Shijiazhuang Coking Plant, replacing the imported product and filling the domestic blank.The product was rated as the national key new product.

Up to now, the product has been sold to abroad such as Iran, India and Saudi Arabia. and applied to more than 50 petrochemical and coking production plants in China and other countries, including SINOPEC Beijing Yanshan Company and Baosteel Group Corporation.

山西三维20万吨/年苯加氢装置
200kt/a benzene hydrogenation plant in Shanxi Sanwei Group Co., Ltd

大庆中蓝石化有限公司50万吨/年C_4综合利用装置
500kt/a C_4 comprehensive utilization plant of Daqing Zhonglan Petrochemical Co., Ltd.

微量硫分析仪

西南院开发的一体化多功能微量硫分析仪是用火焰光度检测器对硫化物的选择性检测进行各种微量硫化物、磷化物的测定，具有灵敏度和选择性高的特点。

微量硫分析仪主要用于高纯度气体企业、甲醇合成气、合成氨厂的精脱硫效果检测；焦炉煤气、转炉气、电石炉气的综合利用；脱硫剂生产企业作产品性能检测等，现已成功销往上海宝钢、天津大学等600多家单位，并进入东南亚市场。

Trace sulfur analyzer

The integrated and multifunctional trace sulfur analyzer developed by SWRDICI utilizes the selective detection of sulfides of flame photometric detector to determine various trace sulfides and phosphides. It is characterized by high sensitivity and selectivity.

The trace sulfur analyzer is mainly used to detect fine desulfurization effect by the manufacturers of high purity gases, methanol and ammonia and the enterprises of comprehensively utilizing coke oven gas, converter gas and calcium carbide furnace gas, and to test product performance by desulfurizer manufacturers. Up to now, the analyzer has been sold to more than 600 customers, including Baosteel Group Corporation, Tianjin University, and even some companies in Southeast Asia.

气相色谱仪

西南院是国家和行业气体标准的归口单位，拥有40余年的特种气体分析仪器开发经验，已开发出新一代用于煤制天然气、特种气体、天然气、高纯气体等领域的色谱分析仪，具有操作简便，分析结果稳定的特点，同时还具有为企业组建中央化验室的成功经验。

Gas chromatograph

SWRDICI is a specified administrative unit for national and industrial gas standards. With more than 40 years of experience in development of special gas analyzers, it has developed a new generation of chromatographic analyzers for coal-based natural gas, special gases, natural gas, high-purity gases, etc. These analyzers are characterized by convenient operation and high reliability. Furthermore, SWRDICI has successful experience in building up the central analysis laboratory for enterprises.

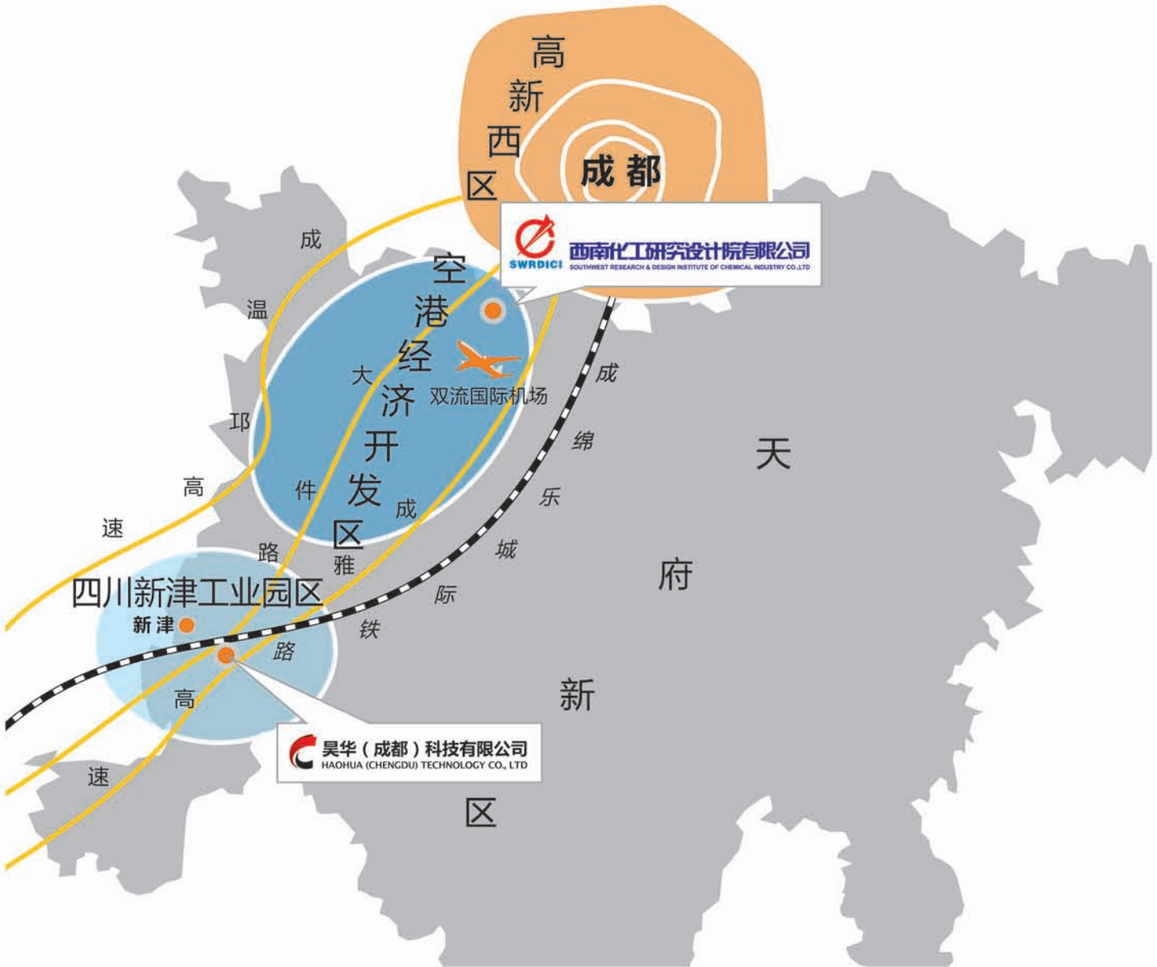
产业基地
INDUSTRIAL BASE

由中国昊华化工集团股份有限公司与西南院于2009年共同投资组建的昊华（成都）科技有限公司，位于四川省新津县工业园区（成都市西南方），距双流国际机场26公里，到成都市区仅20分钟车程。公司规划占地1400亩，分三期建设。

一期已建成投产：2000吨/年N-甲酰吗啉生产装置，10000吨/年环保设备生产线，2000吨/年催化剂生产装置。二期建设正在规划实施。

Haohua (Chengdu) Technology Co., Ltd.-a subsidiary of SWRCIDI invested together by China Haohua Chemical (Group) Corp. and SWRDICI in 2009, is located in Sichuan Xinjin Industrial Park, which is in the southwest of Chengdu with a distance of 26 km to Chengdu Shuangliu International Airport and 20 min drive to the center of Chengdu. The planning area for it is 1,400 mu (1 mu=667 m^2) and the construction will be divided into three phases.

Phase I projects have been completed and put into operation, including 2,000t/a N-formyl morpholine production plant, 10,000t/a environmental protection equipment production line and 2,000t/a catalyst production plant. Phase II projects are under planning.



环保设备厂房
The environmental protection equipment manufacturing workshop

N-甲酰吗啉厂房
The N-formyl morpholine production plant

催化剂厂房
The catalyst production workshop

环保设备制造现场
The environmental protection equipment manufacturing site

产品目录
PRODUCTS LIST

序号 S/N	催化剂 Catalysts
1	CNJ-5甲烷化催化剂 CNJ-5 methanation catalyst
2	CNM-3甲醇脱水制二甲醚催化剂 CNM-3 catalyst for production of dimethyl ether by dehydration of methanol
3	CNZ-1型甲醇催化裂解制氢催化剂 CNZ-1 catalyst for production of hydrogen by catalytic decomposition of methanol
4	CNT-1型甲醇脱氢制甲酸甲酯催化剂 CNT-1 catalyst for production of methyl formate by methanol dehydrogenation
5	CN-31轻油预转化催化剂 CN-31 catalyst for pre-reforming of light oil
6	CN-33气态烃间歇转化催化剂 CN-33 catalyst for intermittent reforming of gaseous hydrocarbons
7	CN-35轻油蒸汽转化催化剂 CN-35 catalyst for steam reforming of light oil
8	CN-36-2气态烃二段热保护催化剂 CN-36-2 thermal protection catalyst for secondary reforming of gaseous hydrocarbons
9	CDO-01煤层气脱氧催化剂 CDO-O1 catalyst for deoxidation of coal mine methane (CMM)
10	EDO-08乙烯精脱氧催化剂 EDO-08 fine deoxidation catalyst for ethylene
11	XDO系列高效脱氧催化剂 XDO series high-efficiency deoxidation catalyst
12	SWEG-1 CO氧化偶联合成草酸酯催化剂 SWEG-1 catalyst for synthesis of oxalic ester by CO oxidative coupling
13	SWEG-2草酸酯加氢制乙二醇催化剂 SWEG-2 catalyst for production of ethylene glycol by hydrogenation of oxalic ester
14	SWET-2012醋酸酯加氢制乙醇催化剂 SWEG-2012 catalyst for production of ethanol by hydrogenation of acetic esters
15	XMTO-201甲醇制烯烃催化剂 XMTO-201 catalyst for methanol to olefins
16	气体超精净化剂 Super-fine purifying agent for gases

序号 S/N	环保设备 Environmental protection equipment
1	一、二、三类压力容器设计与制造 Design and manufacturing of Class I, II and III pressure vessels
2	中低压管壳式余热锅炉制造 Manufacturing of medium- and low-pressure shell-and-tube heat recovery boiler
3	各类反应器制造 Manufacturing of various reactors
4	各类夹套压力容器制造 Manufacturing of various jacketed pressure vessels
5	各类真空压力容器制造 Manufacturing of various vacuum pressure vessels
6	各类搅拌器制造 Manufacturing of various stirrers

序号 S/N	有机化工产品 Organic chemical products	
1	N-甲酰吗啉	N-formyl morpholine
2	N-乙酰吗啉	N-acetyl morpholine
3	叔碳酸乙烯酯	Vinyl versatate (vinyl neodecanoate)
4	叔碳酸钴盐	Cobalt neocarboxylate (Co neodecanoate)
5	新橙皮苷	Neohesperidin

序号 S/N	标准气及分析仪器 Standard gases and analyzers
1	气体标准样品 Standard gas samples
2	WDL-94微机多功能硫分析仪 WDL-94 microcomputer-based multifunctional sulfur analyzer
3	TY-2000微量硫分析仪 TY-2000 trace sulfur analyzer
4	GC-2011H氦离子化气相色谱仪 GC-2011H helium ionization gas chromatograph
5	GC-2013A氩放电气相色谱仪 GC-2013A argon discharge gas chromatograph
6	GC-2011TS宽浓度硫化物分析仪 GC-2011TS wide concentration sulfide analyzer
7	GC-2011S硫化物分析仪 GC-2011S sulfide analyzer
8	GC-2011TF焦炉煤气、天然气、煤层气分析色谱仪 GC-2011TF chromatograph analyzer for coke oven gas, natural gas and coal-bed methane
9	GC-2013AF总烃在线色谱仪等离线和在线色谱仪产品 GC-2013AF online chromatograph for total hydrocarbon and other offline and online chromatographs

企业理念
CORPORATE PHILOSOPHY

企业理念
以人为本，务实创新
企业精神
创新、求实、诚信、高效
企业使命
战略引领至上
创新发展至先
客户服务至诚
员工培育至善
企业愿景
耕耘创新沃土，成就梦想家园

Corporate philosophy
human-orientation, pragmatic innovation
Corporate spirit
innovation, practicability, honesty and high efficiency
Corporate mission
strategic guidance supreme
innovative development first
customer service sincere
staff cultivation perfect
Corporate vision
foster a culture of innovation and establish an ideal enterprise

文化建设
CULTURAL CONSTRUCTION

员工培训
西南院建立了较为完善的员工培训机制，通过送出去，请进来的培训方式，强化内部培训与自我培训，多层次、多渠道、全方位开展员工培训，让每一个员工成为企业发展的中坚力量。
关爱员工
员工是企业的财富。西南院关爱每一位员工，改善工作环境、搭建发展平台、关注身心健康、参与民主管理，建立与员工休戚与共的大家庭关系，共享发展成果。
制度建设
完善服务职能，实现流程再造，规范管理行为。西南院加强制度建设，通过信息化建设、管理过程控制等手段，实现管理水平的有效提升。

Staff training
SWRDICI has established a relatively perfect staff training system to strengthen internal training and self-learning by means of "sending staff out for studying and introducing talents", and develop multilevel, multichannel and all-around training on staff, so that each staff can become backbone of company.
Care for staff
Staff is the wealth of our company. SWRDICI concerns all staff. It is always dedicated to improving their working environment, establishing development platforms for them, paying attention to their physical and mental health, letting them participate in democratic management, building a family-like relationship with staff and sharing development achievements.
System construction
Through using information technology and management process control, perfecting service function, realizing process reengineering and standardizing management behaviors, SWRDICI strengthens system construction to effectively improve management level.

发展愿景
DEVELOPMENT VISION

战略定位

开拓创新，建设平台，带动行业，做强产业。以科技创新为灵魂，以技术开发为主导，以工业化应用为重点，以产业发展为支撑，坚持持续创新，建成有影响力的科技先导型企业。

发展目标

重点在能源、资源与环境等领域开发国内领先的节能减排技术和新材料技术，稳步发展以新能源、替代能源为主的能源化工产业、以工业排放气资源化利用技术及专用设备为主的环保科技产业，以催化剂及专用化学品为主的新材料产业。

Strategic positioning

Developing and Innovating, Establishing Platform, Mobilizing Sector and Strengthening Industry. Based on R&D, focusing on engineering application and supported by industry development, SWRDICI adheres to continuous innovation and building an influential technology oriented company.

Development goal

The emphasis is put on developing the domestic leading energy conservation and emission reduction technologies and new material technologies in the fields of energy source, resource and environment, and steadily developing the energy chemical industry dominated by new and alternative energy sources, the environmental protection technical industry dominated by industrial vent gas reuse and special equipment and the new material industry dominated by catalysts and special chemicals.