第三届中国-阿拉伯国家
技术转移与创新合作大会

THE THIRD CHINA-ARAB STATES TECHNOLOGY TRANSFER AND INNOVATION COOPERATION CONFERENCE

十项主推
重要技术成果

TEN MAJOR TECHNOLOGICAL ACHIEVEMENTS

PREFACE

A seed can change a world; a technology can create a miracle.

At the commencement of the Fourth China-Arab States Expo, the organizer of the Third China-Arab States Technology Transfer and Innovation Cooperation Conference & the Innovative and Advanced Technology and Equipment Exhibition—the scientific and technological section of the Expo—has collected over 200 hi-tech projects and selected 10 major technological achievements from them to publish at the Conference. We expect that these 10 projects can be promoted and commercialized in "Belt and Road" countries.

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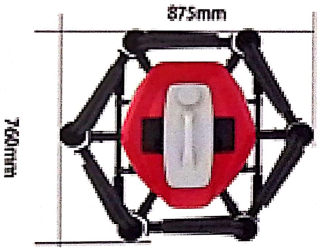
项目一

国机集团 SINOMACH

项目名称：农业无人机和农业生产全过程云平台监控系统
单位名称：中国机械设备工程（银川综合保税）有限公司
项目简介：

农业无人机系统具备自主起降、自动按航线飞行、仿地形飞行与主动避障等功能，可用于农作物植保作业、病虫害监测与分析、作物长势监测与分析；农业云平台系统能对农业生产过程中的机械装备进行远程实时监控与管理，并可为大型农场定制数字化管理系统，实现农业生产全流程监控与管理。



推荐专家：

赵　博　农业生产机械装备国家工程实验室副所长

张　铁　国家农业机械工程技术研究中心技术总监

周利明　土壤机器系统技术国家重点实验室主任

推荐意见：

该技术系统已先后取得了数十项专利和奖项，在有效促进农业生产走向机械化和智能化方面为用户提供全套解决方案，并已在我国成熟推广应用。该技术系统在“一带一路”沿线国家具有可靠的推广性。

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PROJECT 1

PROJECT NAME:

Agricultural UAV and Cloud-based Agricultural Production Monitoring System

PROJECT OWNER:

China Machinery Engineering Yinchuan Free Trade Zone Co., Ltd.

PROJECT PROFILE:

The agricultural UAV system is able to autonomously take off and land, automatically fly either along the preset route or based on terrain and avoid obstacles. It can be used for crop plant protection operations, pest and disease monitoring and analysis, and crop growth monitoring and analysis. The cloud-based agricultural monitoring system allows users to remotely monitor and manage machinery and equipment in agricultural production in real time. With the system, users can also customize digital management system for large farms to achieve monitoring and management throughout agricultural production.

PROJECT REFEREES:

Zhao Bo, Deputy Director, National Engineering Laboratory, Chinese Academy of Agricultural Mechanization Sciences;

Zhang Tie, Technical Director, National Agricultural Machinery Engineering Technology Research Center;

Zhou Liming, Director, National Key Laboratory of Soil Machine System Technology.

REFEREE COMMENTS:

With dozens of patents and awards, the system offers a full range of solutions to help users effectively make agricultural production mechanized and intelligent. The system has been applied in China with excellent performance thus is worth to get promoted in countries along the “Belt and Road”.

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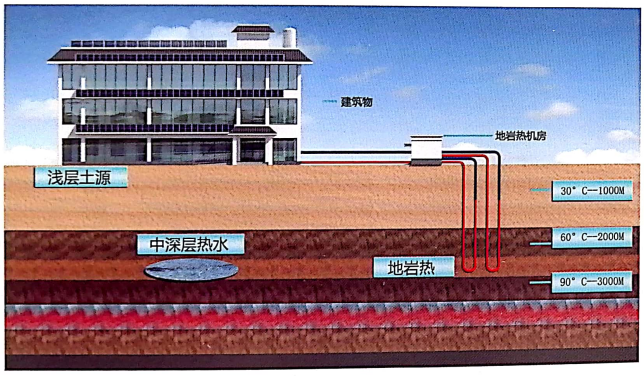
项目二

甘肃省建材科研设计院有限责任公司
Building Materials Research & Design Institute of Gansu Co.,Ltd

项目名称：绿色低碳中深层地热能开发供暖技术
单位名称：甘肃省建材科研设计院有限责任公司
项目简介：

该技术应用封闭循环的深层换热器，将地下深处（2000-2500米）的热能导出，向地面建筑物供热，实现了中深层地热开发“取热不取水”和低品位地岩热的开发利用，对地下水、土壤等周边环境无污染，可满足1.5～2万平方米节能建筑的供暖需求。目前已成功在国内超过100万平方米的建筑中进行了推广使用，是典型的绿色低碳供暖技术。



推荐专家：

代彦军 上海交通大学教授
田斌守 甘肃德龙地热科技有限公司总工程师
李金平 兰州理工大学教授

推荐意见：

该技术具有洁净、无污染、成本低的特性，大大拓展了建筑供热的新空间，开辟了人类能源开发的新领域。

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PROJECT 2

PROJECT NAME:

Green and Low-carbon Building Heating with Mid-deep Geothermal Resources

PROJECT OWNER:

Gansu Building Materials Research & Design Institute Co.,Ltd.

PROJECT PROFILE:

The technology features a closed-loop heat exchanger installed in deep stratum, which transfers underground heat energy in a depth of 2000-2500 meter to overground buildings for heat supply. The technology is not used to obtain groundwater, but to exploit and utilize low-grade underground rock heat energy in the geothermal exploitation in the mid-deep stratum. It is pollution-free to groundwater and soil nearby. The technology can satisfy the heating demand of green buildings with a total floor area of 15,000–20,000 m^2. It has been used as a typical green and low-carbon heating technology in over 1,000,000-square-meter buildings in China.

PROJECT REFEREES:

Dai Yanjun, Professor, Shanghai Jiao Tong University;
Tian Binshou, Chief Engineer, Gansu Delong Geothermal Technology Co., Ltd.
Li Jinping, Professor, Lanzhou University of Technology.

REFEREE COMMENTS:

Clean, pollution-free and low cost, the technology expands the range of heating methods for buildings and opens up a new field of energy development.

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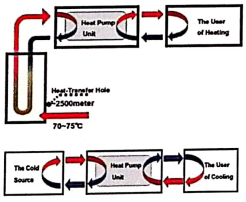
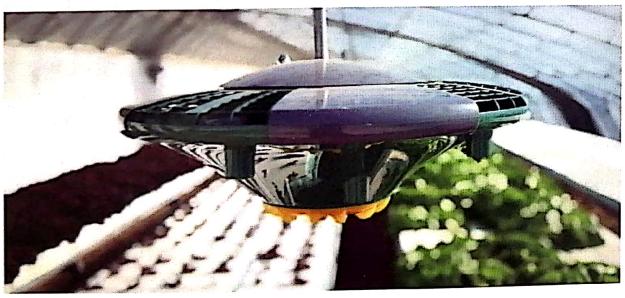


项目三

项目名称：智慧农业多功能植保机
单位名称：国家农业智能装备工程技术研究中心
项目简介：

该技术产品是基于互联网的一款温室内杀菌灭虫辅助设备，能迅速均匀释放臭氧分解细菌和真菌的细胞壁达到杀灭病菌的效果。同时具有黄蓝诱虫灯，通过高浓度的臭氧及极高的压强杀死害虫。该设备可以连上摄像头、温湿度、光照强度等传感器，实现对温室内环境数据的有效采集。



推荐专家：

王　成　国家农业智能装备工程技术研究中心研究员
郑文刚　国家农业智能装备工程技术研究中心研究员
陈立平　国家农业智能装备工程技术研究中心研究员

推荐意见：

该技术通过臭氧杀虫，可大大提高对病虫害的防御与防治，明显减少农药使用量，且无污染无残留，具有突出的增产增收效益。

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PROJECT 3

PROJECT NAME:

Intelligent Multi-function Plant Protector

PROJECT OWNER:

National Engineering Research Center of Intelligent Agricultural Equipment

PROJECT PROFILE:

This product is an Internet-based sterilizing and deinsectization auxiliary device in greenhouses. It can rapidly and evenly release ozone to decompose the cell wall of bacteria and fungi to kill bacteria. It is also equipped with yellow-blue moth-killing lamp and kills pests through high concentrations of ozone under extremely high pressure. This device can be connected with cameras, temperature and humidity sensors, light intensity sensors and other sensors to effectively collect environmental data in greenhouses.

PROJECT REFEREES:

Wang Cheng, Researcher, National Agricultural Intelligent Equipment Engineering Technology Research Center;
Zheng Wengang, Researcher, National Agricultural Intelligent Equipment Engineering Technology Research Center;
Chen Liping, Researcher, National Agricultural Intelligent Equipment Engineering Technology Research Center.

REFEREE COMMENTS:

Through the deinsectization by ozone, this technology can greatly improve the effectiveness of pests and diseases prevention and control, significantly reduce the use of pesticides, produces no pollution and residues, and considerably enhance crop yield and farmers' income.

CONTACT PERSON: Wang Yang
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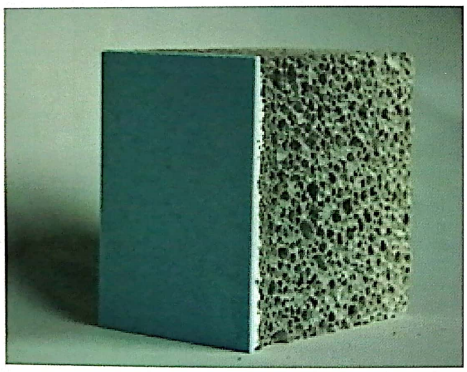
E-mail: wangyang@nercita.org.cn

项目四

项目名称：新型无机装饰微晶发泡保温一体化材料
单位名称：宁夏黑金科技有限公司
项目简介：

该技术是集外饰、保温及防火一体化的绿色节能环保新型无机材料，具有轻质、隔热、隔音、防潮、防火（达到A1级）、防腐、可循环利用等突出性能。产品特别适用于在低温深冷、地下、露天、易燃、易潮以及化学侵蚀等苛刻环境，可广泛应用于建筑、海洋、农业等领域。



推荐专家：

许　健　西安交通大学教授
韩凤兰　北方民族大学教授
张深根　北京科技大学教授

推荐意见：

该技术产品综合利用各种固废，节能环保，节约成本不低于40%，具有显著的创新性、新颖性、实用性，是对传统材料的革命性变革，市场应用前景广阔。

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PROJECT 4

PROJECT NAME:

New Integrated Inorganic Microcrystalline Foaming Decorative and Insulation Materials

PROJECT OWNER:

Ningxia Heijin Technology Co., Ltd.

PROJECT PROFILE:

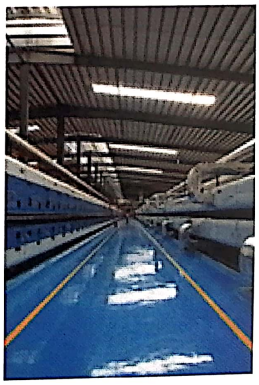
This product is a new type of inorganic material of green, energy-conservation and environmental-protection integrating exterior decoration, thermal insulation and fire prevention, with outstanding performance such as light weight, heat insulation, sound insulation, moisture proofing, fire prevention (up to Level A1), corrosion prevention and recycling utilization. This product is especially suitable for the harsh environment such as low temperature and copious cooling, underground, open air, inflammable, easy-to-damp and chemical erosion, etc., and can be widely used in the fields of architecture, ocean, agriculture, etc.

PROJECT REFEREES:

Xu Jian, Professor, Xi'an Jiaotong University;
Han Fenglan, Professor, North Minzu University;
Zhan Shengen, Professor, University of Science and Technology Beijing.

REFEREE COMMENTS:

This product comprehensively utilizes various solid wastes for energy saving and environmental protection, saves costs for more than 40%, has remarkable innovativeness, novelty and practicability, and is a revolutionary change of traditional materials, with broad application prospect in the market.



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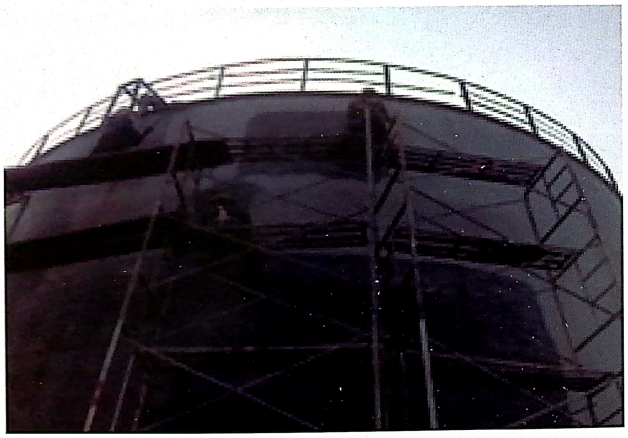
项目五

项目名称：JGB高分子聚合物水性锈固化底漆
单位名称：北京锦绣新技术发展有限公司
项目简介：

该研发成果为高耐盐雾的水性锈固化涂料，可将除锈和底漆为一体，适用于军舰、船舶、钢铁设施、钢铁结构等一切锈蚀钢铁基材的除锈、防锈以及底漆。



推荐专家：

冯金秋 中国建筑科学研究院物理所研究员
路国忠 北京建筑材料科学研究总院教授
杨西伟 中国建筑节能协会教授

推荐意见：

该技术成果将生锈层固化转化回基层，不削弱钢材截面面积，可明确延长钢材的使用寿命，是一项重要的创新性成果。

联系人：苏斌　　联系电话：18515278635
邮箱：subinsww@163.com

PROJECT 5

PROJECT NAME:

JGB Waterborne Permeable Rust-curing Primer

PROJECT OWNER:

Beijing Fairview New Tech Co., Ltd.

PROJECT PROFILE:

The project relates to water-based rust curing coating with excellent salt-fog resistance. Combining rust removal and primer application, this R&D result is suitable for rust removal and prevention and primer application for all rust-prone steel- and iron-based metals in warships, ships, steel facilities and structures.

PROJECT REFEREES:

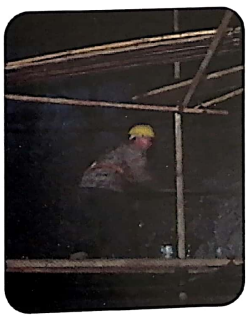
Feng Jinqiu, Researcher, Institute of Physics, China Academy of Building Research;

Lu Guozhong, Professor, Beijing Building Materials Academy of Science Research;

Yang Xiwei, Professor, China Association of Building Energy Efficiency.

REFEREE COMMENTS:

This technology is an important innovation, which cures the rust layer and converts it back into the base layer without reducing the cross-sectional area of steel while significantly extending its service life.



CONTACT PERSON: Su Bin
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项目六

宁夏大学 NINGXIA UNIVERSITY

项目名称：智能风光互补提水地下渗灌灌溉系统
单位名称：宁夏大学
项目简介：

该系统应用智能远程监测、控制系统，利用风能、太阳能直接带动水泵（不需要储电设备），将水、肥、气通过地下渗灌管道按需输送到植物根基部进而实现精准灌溉。该系统将可溶性固体肥料或液体肥料配兑而成的肥液与灌溉水一起，适时、适量、精准地输送到作物根部土壤供作物吸收，在构建不同干旱环境下植物正常生长所需水肥的绿色装备体系方面具有创新性。

推荐专家：
包子云 宁夏水科院研究员
班乃荣 宁夏农科院研究员

推荐意见：

风光互补节水灌溉技术与设备有效集成了绿色能源提水、物联网手机App智能控制、地下高效渗灌等关键技术，非常适合现代绿色农业的发展需求。

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PROJECT 6

PROJECT NAME:

Intelligent Underground Infiltration and Irrigation System with Wind-Solar Complementary Water-Lifting

PROJECT OWNER:

Ningxia University.

PROJECT PROFILE:

With intelligent remote monitoring and control subsystem, this system uses wind and solar energy to directly drive water pump (no electrical storage is required), transfer water, fertilizer and air through underground infiltration and irrigation pipeline to plant base on demand so as to realize accurate irrigation. This system combines the fertilizer liquid formed by the blending of soluble solid fertilizer or liquid fertilizer with irrigation water to timely, appropriately and precisely deliver the fertilizer liquid to the root soil of crops for absorption, which is innovative in constructing a green equipment system of water and fertilizer required for normal growth of plants under different drought conditions.

PROJECT REFEREES:

Bao Ziyun, Researcher, Ningxia Institute of Water Resources Research;
Ban Nairong, Researcher, Ningxia Institute of Water Resources Research.

REFEREE COMMENTS:

Wind-Solar Complementary Water-saving Irrigation Technology and equipment integrated green energy water lifting, intelligent control of IOT mobile app, underground efficient infiltration irrigation and other key technologies, which meets the demand for the development of modern and green agriculture.

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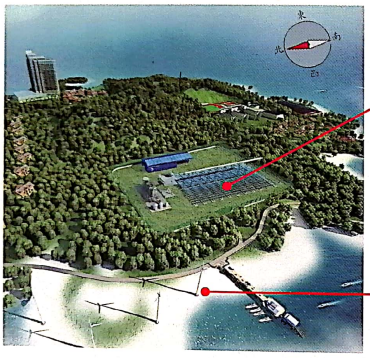
上海骄英能源科技有限公司
SHANGHAI JOIN-IN ENERGY TECHNOLOGIES Co.,Ltd

项目名称：零能耗太阳能光热海水淡化技术
单位名称：上海骄英能源科技有限公司、上海科学技术交流中心
项目简介：

该系统运行中所需要的电力借助太阳能光伏、风能等可再生能源发电耦合提供，可通过多效蒸馏淡化装置制出高品质淡化海水。该系统所应用的海水淡化系统是典型的绿色化集成制造系统，生产工艺属于绿色化生产，在中国已有多年的成功应用经验。



Concentrating Solar Desalination

Renewable Power

推荐专家：
邵希重 黑龙江省电力勘察设计研究院副总工程师
宋景慧 广东电科院能源技术有限责任公司教授

推荐意见：

该技术系统是利用太阳能、风能等清洁能源为海水淡化系统提供持续热能及电力的重要创新型成果，在水资源短缺地区特别是沿海淡水缺乏地区具有可靠的推广应用价值。

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PROJECT NAME:

Zero Fossil Energy Consumed Concentrating Solar Thermal Seawater Desalination Technology

PROJECT OWNER:

Shanghai JOIN-IN Energy Technologies Co., Ltd.
Shanghai Science and Technology Exchange Center

PROJECT PROFILE:

The power needed in the operation of this system is provided by the coupling of renewable energy sources such as solar photovoltaic and wind energy, and this system can produce high-quality desalinated seawater through multi-effect distillation and desalination devices. The seawater desalination subsystem used in this system is a typical integrated green manufacturing system. The production technology belongs to the green production and has been used successfully in China for many years.

PROJECT REFEREES:

Shao Xizhong, Deputy Chief Engineer, Heilongjiang Electric Power Survey, Design and Research Institute;
Song Jinghui, Professor, Energy Technology Co., Ltd., Guangdong Electric Power Research Institute.

REFEREE COMMENTS:

This technology system is an important innovative achievement in the utilization of clean energy such as solar energy and wind energy to provide sustainable thermal energy and electric power for seawater desalination system. It is reliable and worthy popularizing and applying in areas with water shortage, especially areas with coastal freshwater shortage.

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项目八

项目名称：航空飞行气象监测及预警平台
单位名称：上海市生态气象和卫星遥感中心
上海科学技术交流中心

项目简介：

该平台通过采用超级计算机数值天气预报，结合我国自主研发风云系列卫星资料、地基雷达等综合观测和人工智能诊断分析算法等技术而开发的一个能有效适用于航空气象行业的专业分析显示平台。能有效实现对短时强降雨、大雾等危险天气的识别和高频预报，可广泛应用于机场、航空公司、空管部门、飞行学院以及国产大飞机试飞等各种服务场景。

推荐专家：

沈学顺 中国气象局数值预报中心研究员
邵宗有 中科星图股份有限公司教授

推荐意见：

该平台应用规范、专业性强、预报精准度高，为有效解决航空气象难点问题提供了新手段，填补了国内相关领域空白，是我国自主研发科研成果向实际业务转化的典范。

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PROJECT 8

PROJECT NAME:

Meteorological Monitoring and Early Warning Platform for Aviation Safety

PROJECT OWNER:

Shanghai Ecological Forecasting and Remote Sensing Center
Shanghai Science and Technology Exchange Center

PROJECT PROFILE:

This platform is an effective professional analysis and display platform applicable to aeronautical meteorology industry by using the numerical weather forecast of supercomputer, combining the data from satellites of Fengyun series independently developed by China with ground-based radar and other integrated observation and artificial intelligence diagnosis and analysis algorithms. It can effectively realize the identification and high-frequency forecast of dangerous weather such as short-term heavy rainfall, dense fog, etc., and can be widely used in various service scenarios such as airport, airline, air traffic control department, flight academy and flight test of domestic large aircraft.

PROJECT REFEREES:

Shen Xueshun, Researcher, Numerical Weather Prediction Center of China Meteorological Administration;
Shao Zongyou, Professor, GEOVIS Co., Ltd.

REFEREE COMMENTS:

This platform fully conforms to the application standards of the aviation industry, is highly professional, and has a high accuracy of prediction. It provides a new means to effectively solve difficult problems in aeronautical meteorology, fills the gaps in related fields in China, and is a model of putting China's independent R&D achievements into commercial use.

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项目名称：“一带一路”科技创新合作大数据协同服务平台
单位名称：同方知网（北京）技术有限公司
项目简介：

该平台以CNKI自主研发的 KBase全文数据库管理系统、KSpider网络信息采集系统、TPI信息资源建设与管理系统、大数据分析等技术为支撑，以CNKI学术文献、专利、科技成果、法律法规等为基础数据，可实时抓取互联网、企业及科研机构的最新技术动态，并关联清华大学等高校知识产权信息服务中心，支持供、需、中间方三方的即时通讯、在线研讨、视频研讨，是大数据、互联网等技术有效服务知识经济的重要桥梁。

推荐专家：

范爱红 清华大学知识产权信息服务中心主任
唐 磊 中国社会科学院信息情报研究院研究员

推荐意见：

该平台通过大数据分析技术展示知识图谱，反映问题热点，对于实现政产学研协同机制的建立提供了有效的基础设施，可以切实促进产学研协同中形成的技术成果实现转移、转化。

联系人：周宝荣 联系电话：18610294224
邮箱：zbr7923@cnki.net

PROJECT NAME:

Big Data Collaborative Service Platform for the “Belt and Road” Technology Innovation and Cooperation

PROJECT OWNER:

Tongfang Knowledge Network Technology Co., Ltd. (Beijing)

PROJECT PROFILE:

The platform comprises CNKI's self-developed KBase full-text database management system, KSpider network information acquisition system, TPI information resource construction and management system and big data analytics system. Underpined by these systems, the platform can capture the latest technology trends of the Internet, enterprises and scientific research institutes in real time from CNKI's academic literature, patents, scientific and technological achievements, laws and regulations, etc. The platform also links with the intellectual property information service center of Tsinghua University and other universities to support instant communication, online discussion and video seminar of suppliers, demanders and intermediaries. It is an important bridge for big data, the Internet and other technologies to effectively serve the knowledge-based economy.

PROJECT REFEREES:

Fan Aihong, Director, Intellectual Property Information Service Center, Tsinghua University;
Tang Lei, Researcher, Institute of Information and Intelligence, Chinese Academy of Social Sciences.

REFEREE COMMENTS:

This platform shows the knowledge graph through the big data analysis technology, reflects the hot-spot problems, provides the effective infrastructure for the establishment of cooperation mechanism for integration of government, industry, university and research institute, and can effectively promote the transfer and transformation of technological achievements formed in the integration of industry, university and research institute.

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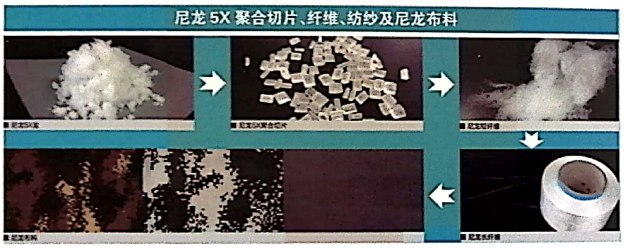
项目十

项目名称：生物基戊二胺及尼龙5X产业化关键生产技术
单位名称：中国科学院微生物研究所
宁夏伊品生物科技股份有限公司

项目简介：

该项目针对国内赖氨酸发酵行业产能严重过剩及尼龙材料行业核心技术被国外垄断这两大产业问题，开发出生物基戊二胺全套生产技术，已建立了3700吨/年尼龙56的中试线，设计了万吨级戊二胺/尼龙56生产工艺包，正在安装调试万吨级生产设备，倒排工期至10月份投产，可为企业新增工作岗位及产值，实现企业转型升级和产业结构调整。



推荐专家：

杨青春 中科院西安分院副院长
张兴昌 西北农林科技大学研究员

推荐意见：

该项目开发了生物基戊二胺全套生产技术，优化设计万吨级戊二胺生产工艺包，并建立了相应规模的生产线，非常有助于企业产业结构调整和转型，应用前景广阔。

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PROJECT 10

PROJECT NAME:

Key Production Technology for the Industrialization of Bio-based 1,5-diaminopentane and Nylon 5X

PROJECT OWNER:

Institute of Microbiology, Chinese Academy of Sciences
Ningxia EPPEN Biotech Co., Ltd.

PROJECT PROFILE:

In view of the serious overcapacity of domestic lysine fermentation industry and the foreign monopoly for core technology of nylon material industry, in this project, a complete set of production technology of bio-based pentamethylene diamine has been developed, a pilot line of 3,700 tons of Nylon 56 per year has been set up, and a 10,000-ton pentamethylene diamine/nylon 56 production process package has been designed. The 10,000-ton production equipment is now under installation and commissioning and will be put into operation in October to create new jobs and output value for enterprises, and realize their transformation and upgrading as well as industrial structure adjustment.

PROJECT REFEREES:

Yang Jingchun, Deputy Director, Xi'an Branch of Chinese Academy of Sciences;
Zhang Xingchang, Researcher, Northwest Agriculture & Forestry University.

REFEREE COMMENTS:

In this project, a complete set of production technology of bio-based pentamethylene diamine has been developed, a 10,000-ton pentamethylene diamine production process package has been designed and optimized, and a production line with the corresponding scale has been set up. These efforts are very helpful for the adjustment and transformation of the industrial structure of enterprises, and have a wide range of potential applications.

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