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《中文科技期刊数据库》(维普网)

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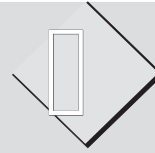
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LEI Cong ZHANG Cheng LEI Yundi

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Abstract Through conducting electrolytic purification experiments using the residual material with high levels of impurities such as Sn Sb and Bi left over from the physical purification of indium as raw material the influencing factors during the electrolytic purification process of indium were studied. The research indicates that for indium raw materials with high levels of impurity elements such as Sn Sb and Bi considering both the effect of electrolytic purification and electrolysis efficiency the optimal electrolytic parameters are determined as follows indium ion concentration of 0 g/L gelatin addition of 0 g/L electrolyte circulation flow rate of 200 L/h electrolyte pH value of 2.0 and current density during electrolysis of 0 A/m². The purity of the electrolyzed indium product can reach over 99.99% and the quality meets the requirements of the YS/T 202 standard enabling the recycling and reuse of indium residual material generated during the physical purification process of indium.

Key words indium electrolytic refining impurity content recycling and reuse

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Application of Vehicle Fuel Cell System on Power Generation
in Plateau and Cold Region

TANG Gang^{1 2} CAO Lei^{1 2} LIU Yu^{1 2} HU Jun^{1 2}

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Abstract As the fuel cell system technology continues to mature the parts supply chain is becoming more and more perfect the system has been widely used in the field of commercial vehicles in order to adapt to more application scenarios the requirements for its environmental adaptability are becoming higher and higher. At present most of the fuel cell system is applied below the altitude of 2000m and there are few application cases in the high-cold plateau environment. In order to clarify the application conditions of the fuel cell system in the high-cold plateau environment this paper analyzes the components performance and reliability of the system and propose the corresponding design scheme. It provides an important basis for the application of fuel cell system in the field of transportation and power generation.

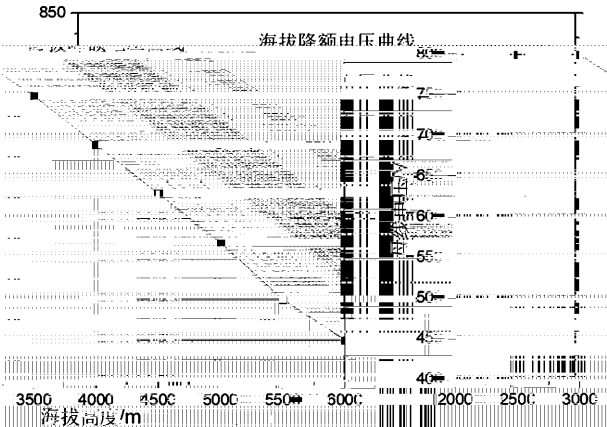
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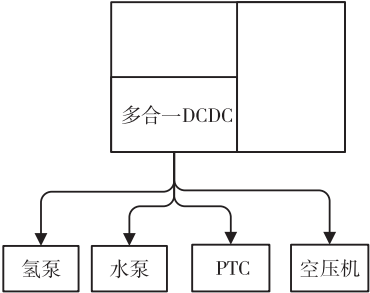
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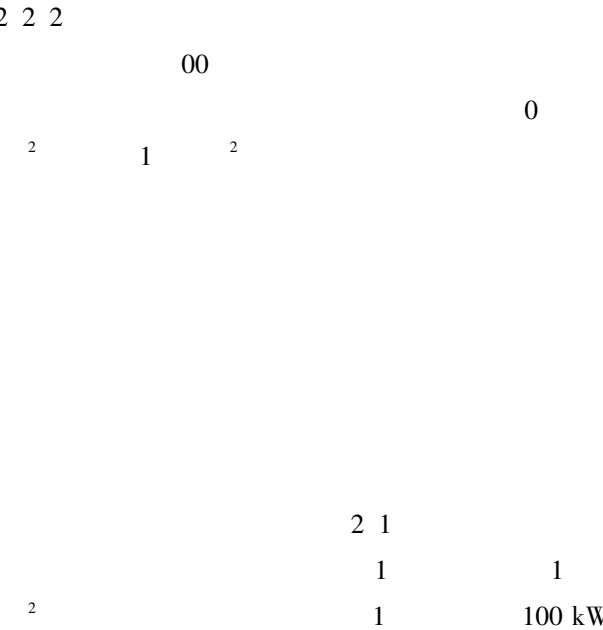
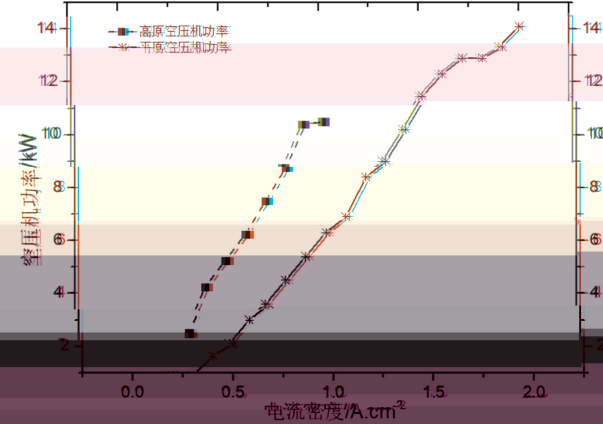
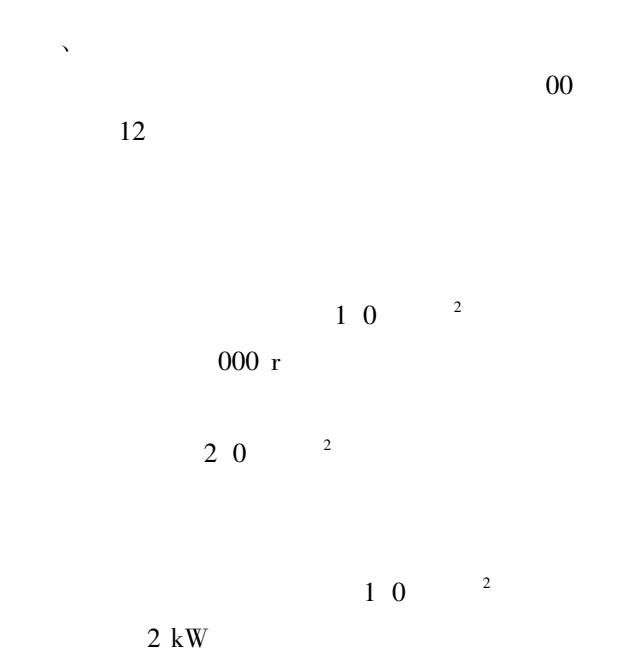
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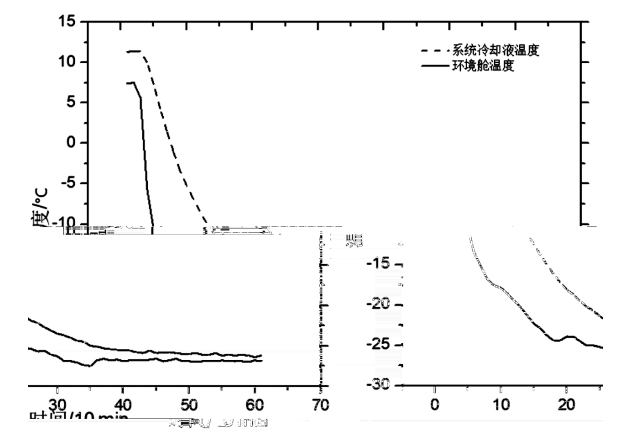
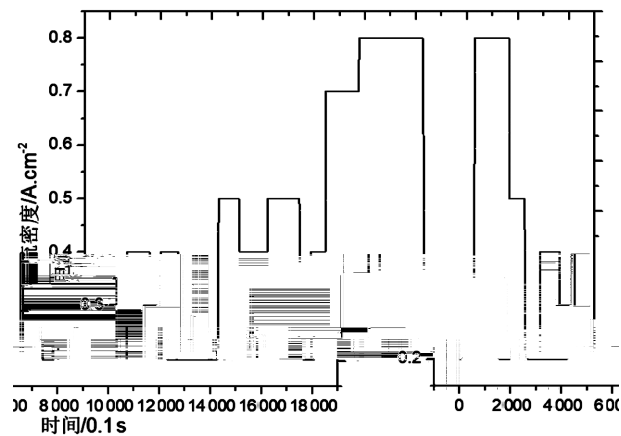
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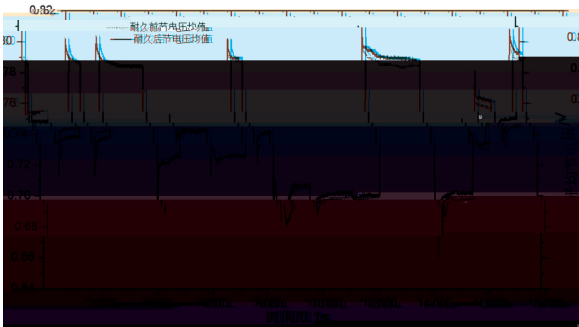
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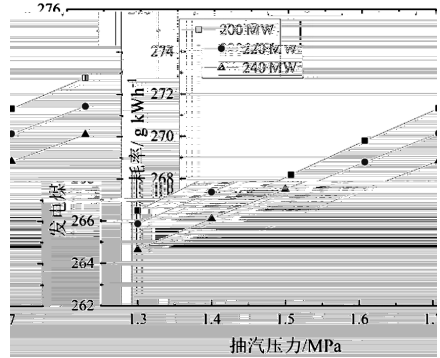
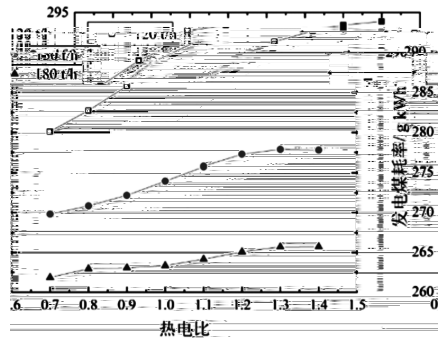
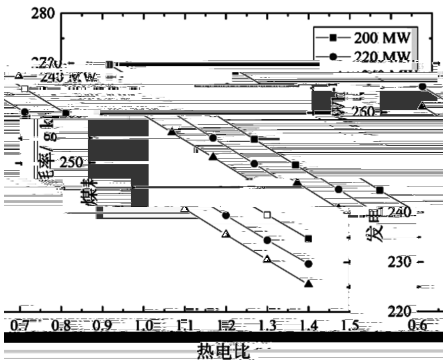
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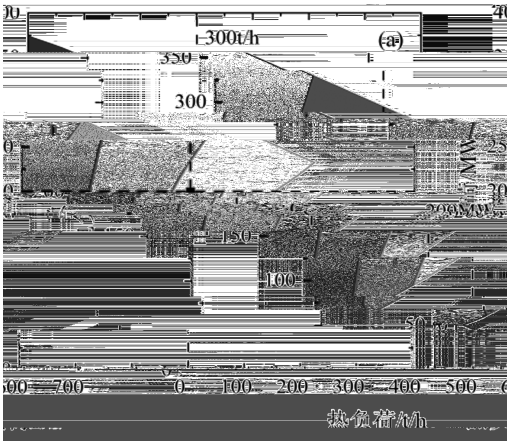
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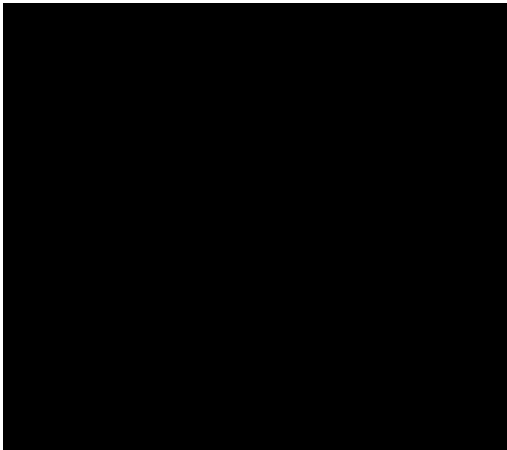
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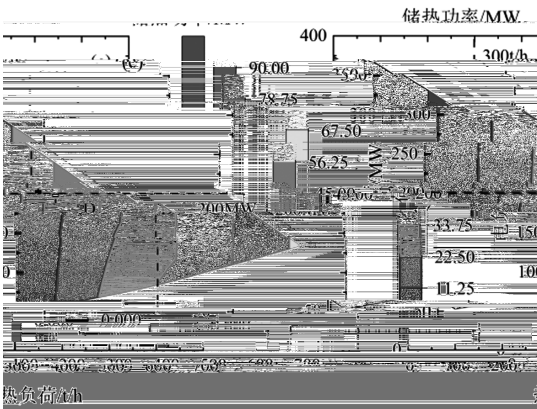
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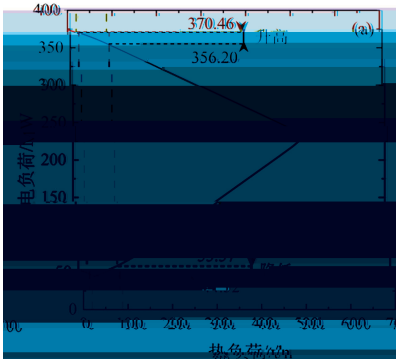
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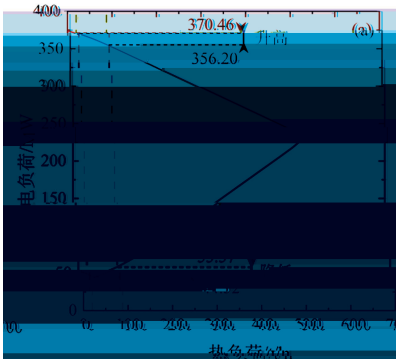
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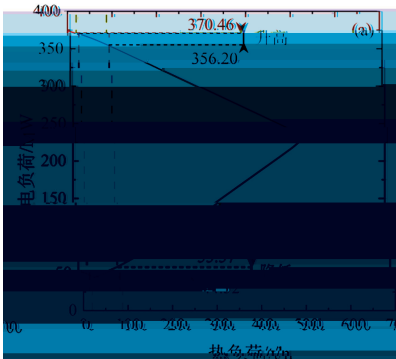
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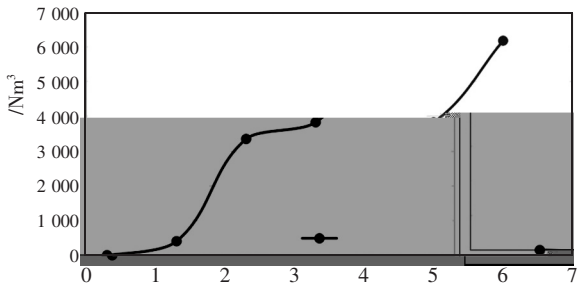
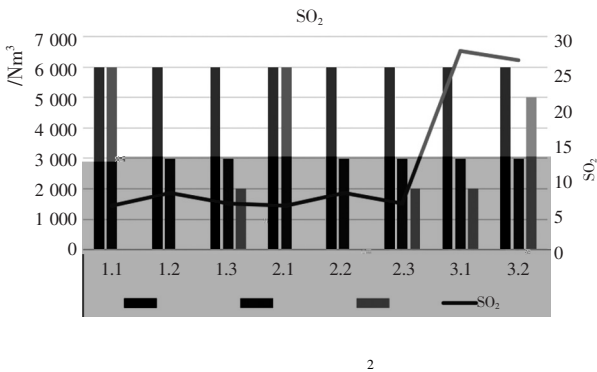
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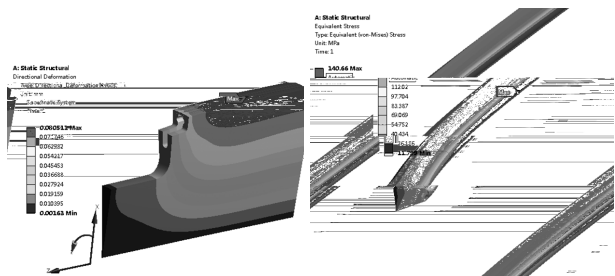
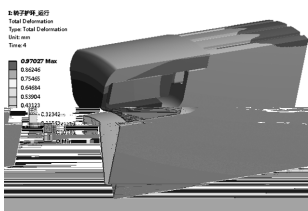
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Overview of The Configuration Scheme for Automation Components of Pump Turbine

YAN Hao

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Abstract The pump-turbine and its auxiliary equipment of the pumped storage unit need to be equipped with various detection automation components. These automation components collect the status parameters of each part and feed them back to the control equipment and monitoring system which is an important part to ensure the safe and stable operation of the unit. Relevant national and industry standards have made basic regulations and requirements for the configuration of automation components for pump-turbine. In engineering projects engineering experience is also an important technical reference and guidance. This article summarizes and generalizes t

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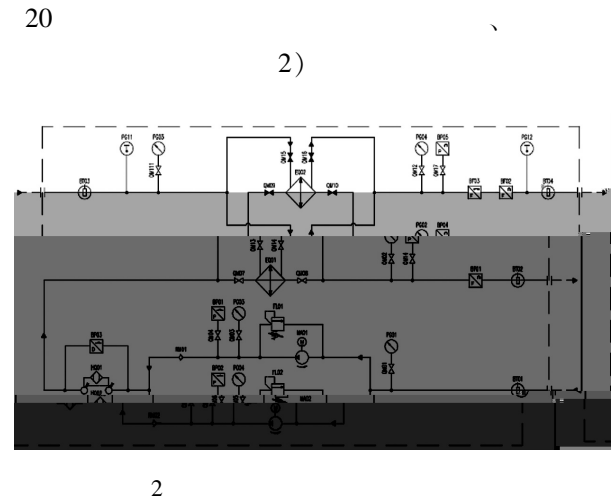
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Research on Abrasion Repair of the Runner Chamber
in Bulb Tubular Turbine

CHEN Sheng WEI Tianpeng HE Xiaoyi GE Mingkai

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Abstract In order to solve the erosion problem of the runner chamber in bulb tubular turbines of hydropower stations with high sediment content this paper takes the third C-level inspection and minor repair of a certain bulb tubular hydropower station as an example. Two methods namely surfacing welding and Belzona 1 11 polymer material repair were adopted to repair the erosion of the runner chamber of the tubular unit. The damage conditions of the repaired runner chamber within a certain operation cycle were analyzed to explore the repair methods for the runner chamber of low-head tubular units in hydropower stations providing a reference basis for the safe and stable operation of similar hydropower stations.

Key words tubular turbine runner chamber abrasion

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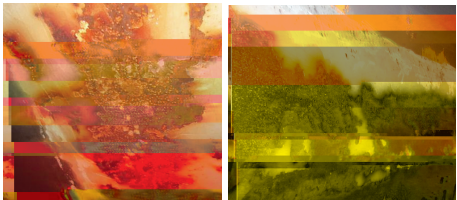
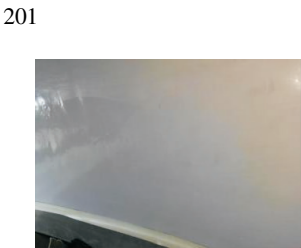
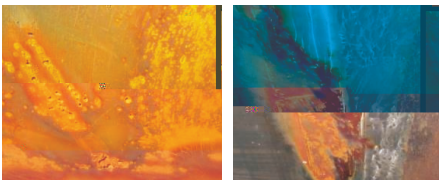
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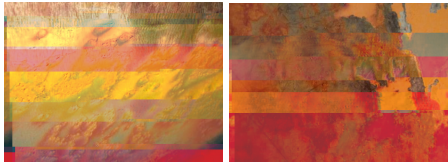
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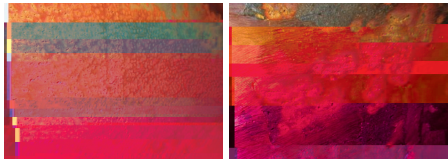
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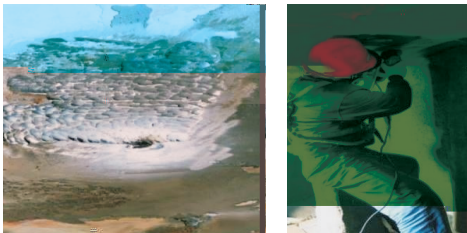
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Research on the Current Competitive Situation of Electrical Penetration Assemblies in the Chinese Nuclear Power Equipment Market

ZHONG Wei¹ LIU Nanheng¹ GUO Yunqiang² YANG Ming YU Gaowei¹

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Exploration on Bearing Optimization of HPR1000 Nuclear Energy Generator Based on Rotor Dynamics Stability

GUAN Yongsheng QIN Chuan

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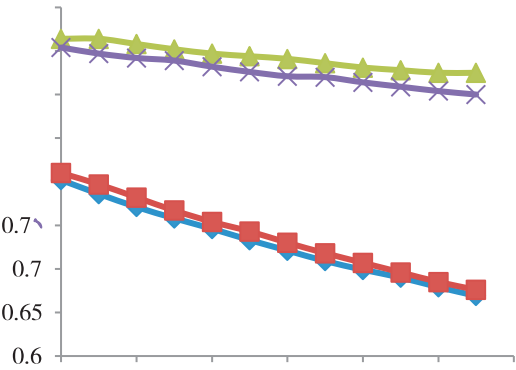
Abstract This study focuses on optimizing the bearing loss of the HPR1000 nuclear energy generator aiming to reduce loss while maintaining rotor stability approaching international technology levels. Utilizing the DyRoBeS sim

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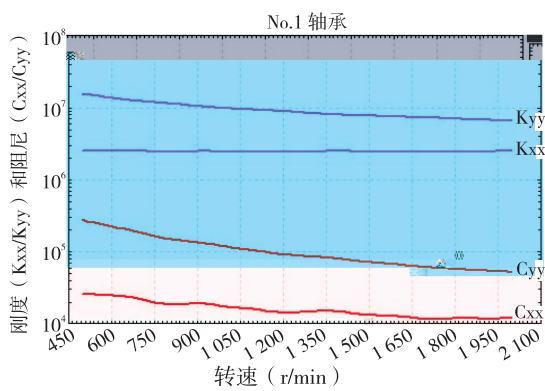
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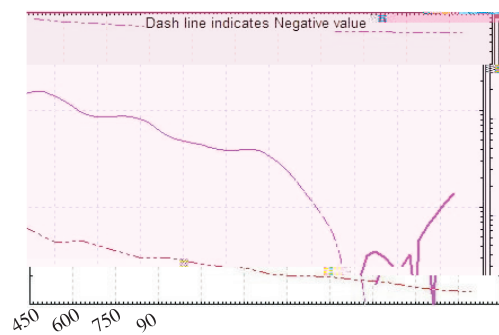


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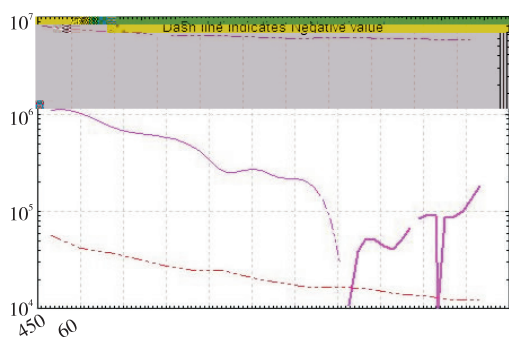
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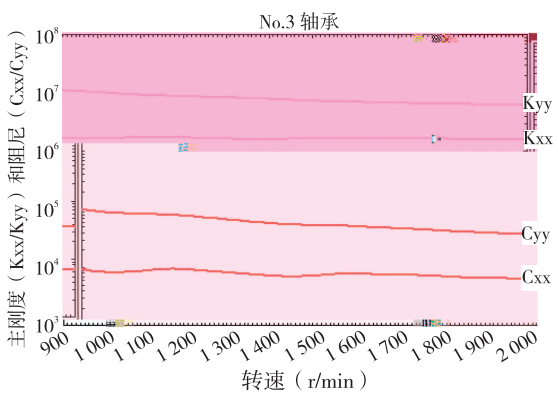
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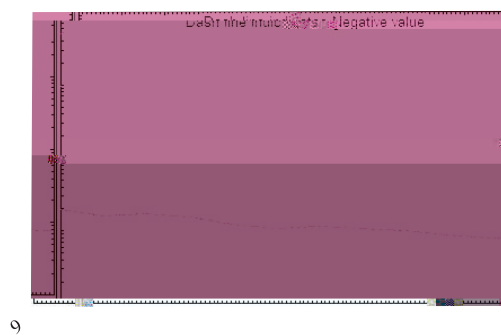
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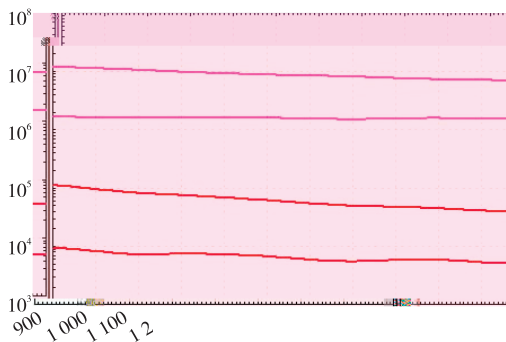


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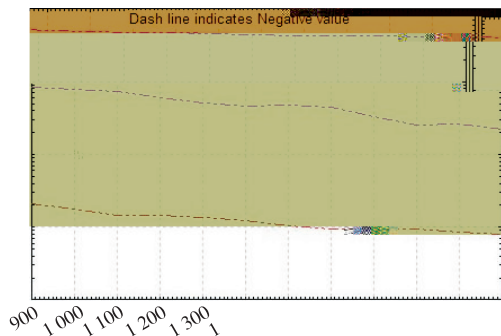


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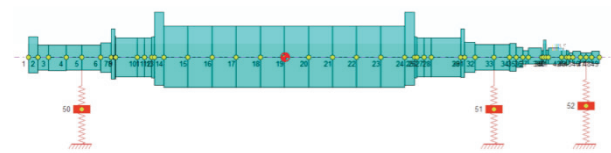
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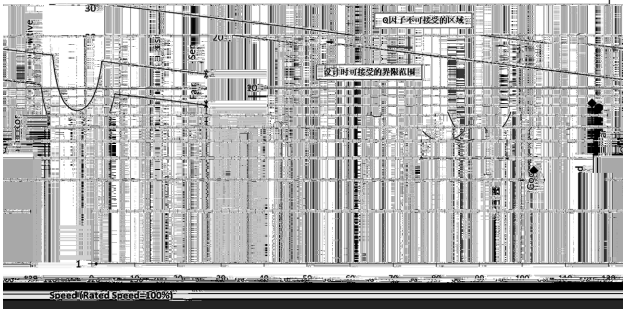
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Analysis on the Construction Path of Nuclear Power Equipment Industry Chain under the “Double Carbon” Target

LIU Runzhi

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Abstract Under the goal of “dual carbon” nuclear power construction has ushered in a new round of construction peak. Simultaneously the application of third-generation nuclear power technology has brought unprecedented opportunities for the development and upgrading of China s nuclear power equipment industry chain. This paper probes into the current situation and existing problems within the nuclear power equipment industry chain focusing on core areas including accelerating the cultivation of high-quality resources deepening key technology tackling improving the level of safety and quality and deepening coordination and integration. Based on this analysis the construction path of the nuclear power equipment industry chain is put forward to provide theoretical basis and practical guidance for enhancing its tenacity and safety level.

Key words nuclear power equipment industrial chain safety toughness

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Research on Wet Air Oxidation Treatment and
Resource Utilization of Sludge

LIAO Yong¹ WAN Zhigang¹ WANG Zhiyong¹ PANG Xiaoyi¹ TAN Yaohui¹ SUN Hao²

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Abstract In this study the characteristics of sludge before and after wet oxidation treatment were discussed through laboratory experiments and the feasibility of making packaging materials from sludge after wet air oxidation WAO treatment was verified. The results showed that the oxidation degree of WAO of sludge increased with the increase of holding time reaction temperature and initial pressure and the optimal oxidation degree achieved in this experiment was 2. %. WAO of sludge would release oxidation heat resulting in the reaction system temperature higher than the set insulation temperature. In addition the heat preservation stage was the main reaction stage of sludge degradation. The AWO of sludge led to the migration of organic matter to the liquid phase after degradation which increased the concentration of COD BOD and ammonia nitrogen in the liquid phase and reduced the content of organic matter and pH value of the sludge. At the same time the particle size of the wet oxidized sludge was smaller the specific surface area was larger the water content and Zeta potential were lower. After WAO treatment the sludge had better solid-liquid separation effect. Under the condition that the sludge addition amount after wet oxidation was % dry base the sludge-based packaging materials prepared in this experiment met the requirements of packaging industry and achieved 1. 0 % sludge retention rate.

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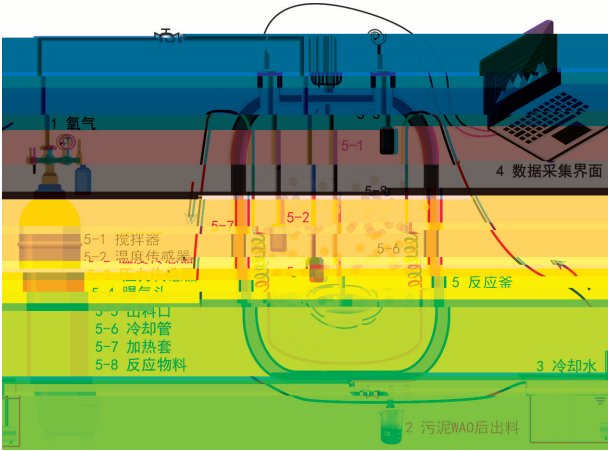
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Key words sludge wet air oxidation packaging material

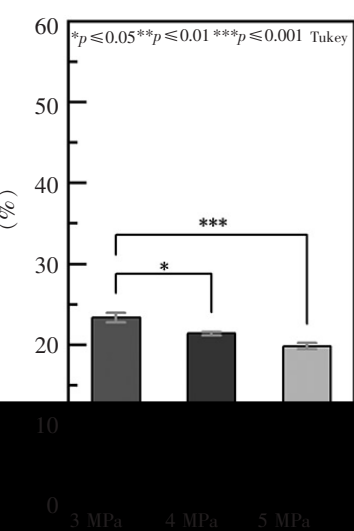
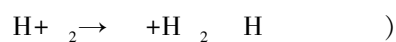
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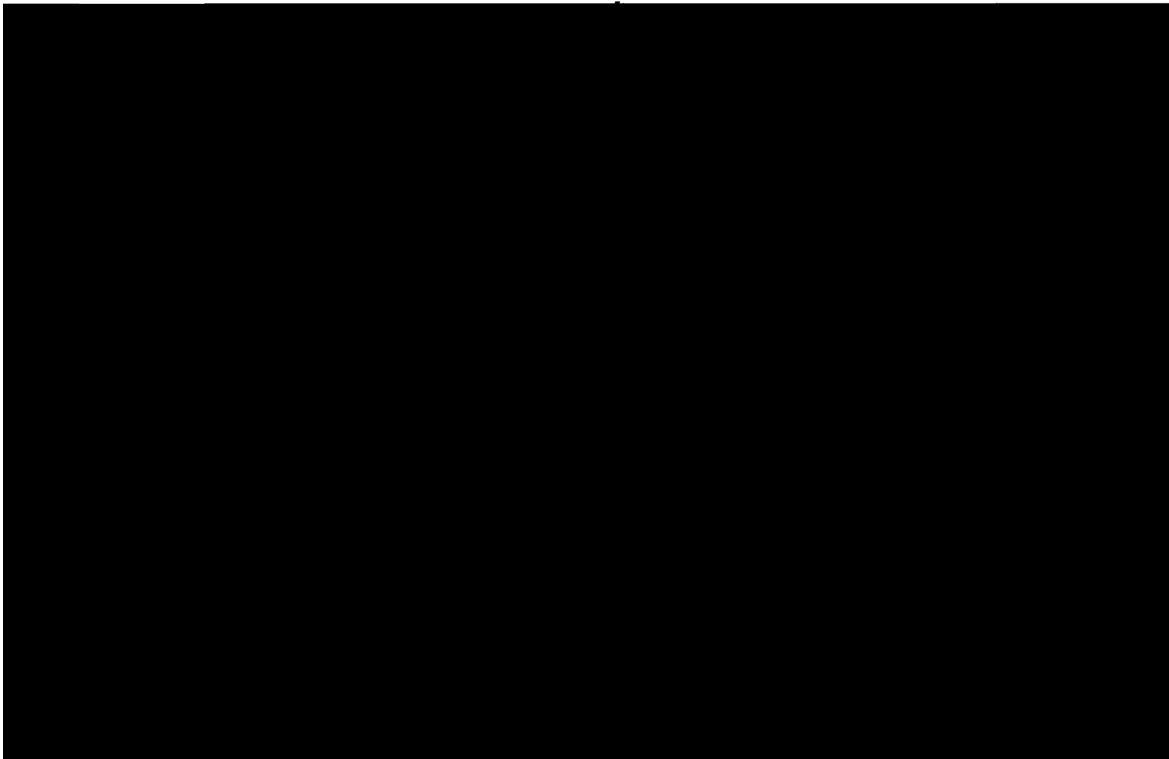
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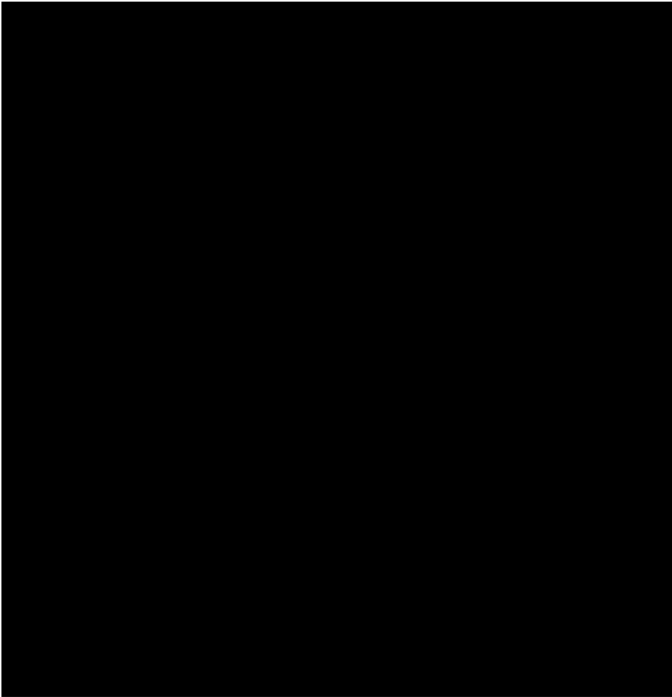
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Research Status and Development of Carbon Capture Technology under the Background of Carbon Peaking and Carbon Neutrality”

WANG Xiaoli^{1 2} WEI Geng^{1 2} LIU Xinglei^{1 2}

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Abstract As the world s largest energy producer and largest energy consumer China faces a formidable task in reducing carbon emissions with a long journey ahead to achieve the carbon peaking and carbon neutrality goals. Scholars and industry experts both domestically and internationally are focusing on research in fundamental studies industrial trial and commercial applications of carbon capture technologies. To gain a clearer understanding of current research progress in carbon capture technologies this paper summarizes the research status of four carbon capture technologies pre-combustion capture post-combustion capture oxy-fuel combustion and chemical looping combustion CLC . The advantages and disadvantages of different carbon capture technologies and their application scenarios are summarized meanwhile the future research direction of CCUS technology is proposed. CLC technology has made a great breakthrough from laboratory research to engineering application and is one of the most promising carbon capture technologies in the future. Continuous efforts should focus on reducing energy consumption lowering costs and scaling up operations. It is imperative to accelerate the establishment of CCUS technological frameworks and large-scale integrated demonstration projects while fostering the development of efficient low-energy cost-effective CCUS business models tailored to China s national conditions. These initiatives will ultimately contribute to achieving the strategic goals of "carbon peak" and "carbon neutrality".

Key words carbon peaking and carbon neutrality carbon capture CCUS chemical looping combustion research progress

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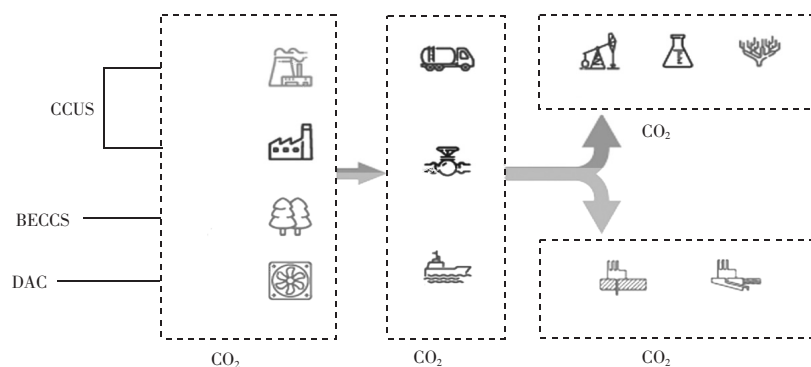
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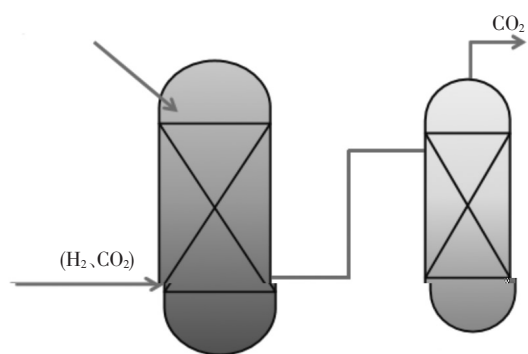
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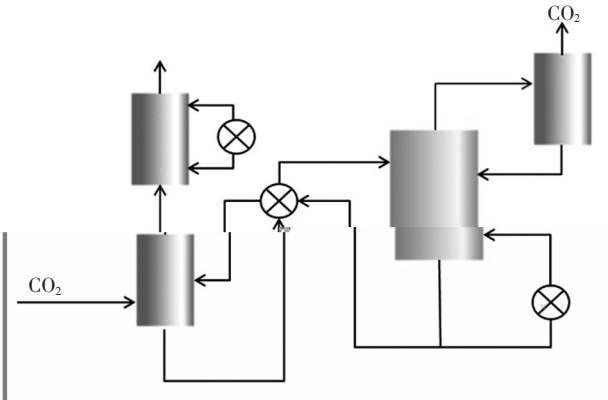
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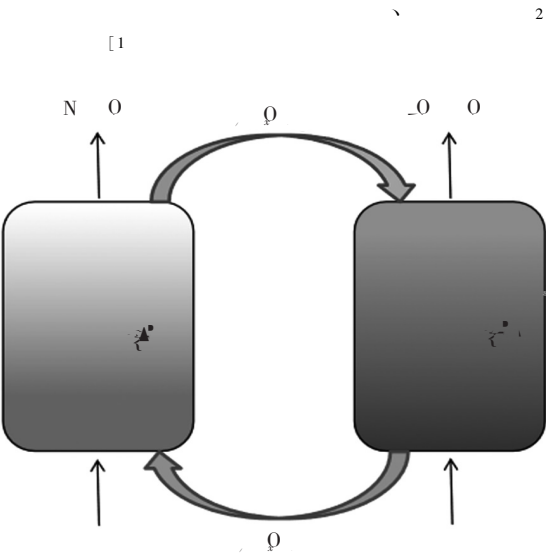
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Energy Value Chain Management and Collaboration Service System Research for Manufacturing Enterprises towards the Dual Carbon” Goals

REN Panqiu LING Hongbing HUANG Xi FENG Rui WANG Xu

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Abstract In response to the demand for digital and lean management of the manufacturing energy value chain under the national dual carbon goal taking the typical branch of Dongfang Electric Machinery Co. Ltd. of Dongfang Electric Group as the object based on the analysis of the energy value chain of value creation transmission and value-added in the manufacturing process an energy value chain management and collaborative service system has been developed to achieve digital lean and intelligent management and service of the manufacturing energy value chain which can guide the energy-saving and carbon reduction technology transformation of enterprises. The application results show that the system can effectively identify the key links of energy conservation and carbon reduction in the energy supply system. Through the technological transformation of related equipment or subsystems the comprehensive energy consumption per unit output value has been reduced by 10% and the carbon emissions per unit output value have been reduced by12% effect

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$$T_1 = T_r \left\{ 1 + \frac{1}{\eta} \left(\pi_c^{\frac{k-1}{k}} - 1 \right) \right\} \quad (11)$$

$$\frac{P_1}{T_1} = \frac{P_r}{T_r} \pi^{\frac{k-1}{k}} \quad (12)$$

$$T = \frac{1}{\eta} \frac{k}{k-1} \frac{0}{1} \frac{D}{n} R T_r \left(\pi_c^{\frac{k-1}{k}} - 1 \right) \quad (1)$$

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$$T_2 = T \left\{ 1 - \eta \left[1 - \left(\frac{1}{\pi} \right)^{\frac{k-1}{k}} \right] \right\} \quad (1)$$

$$T = \eta \frac{k}{k-1} \frac{0}{1} \frac{D}{n} R T \left[1 - \left(\frac{1}{\pi} \right)^{\frac{k-1}{k}} \right] \quad (1)$$

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$$J = \frac{\pi}{0} \frac{dn}{dt} \eta T - T \quad (20)$$

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$$T = T_1 (1 - \eta) + \eta T \quad (21)$$

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$$\frac{T}{T} = \eta \quad p$$

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$$\eta_v = \eta_{v0} - \left[\frac{n}{n_0} \right]^2 - 1 \quad (2)$$

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Practices and Explorations of Science and Technological Information
in Supporting Enterprise Technology Innovation

LINGHU Wenqian¹ ZHANG Yuan¹ CHEN Bingyuan² TIAN Yu

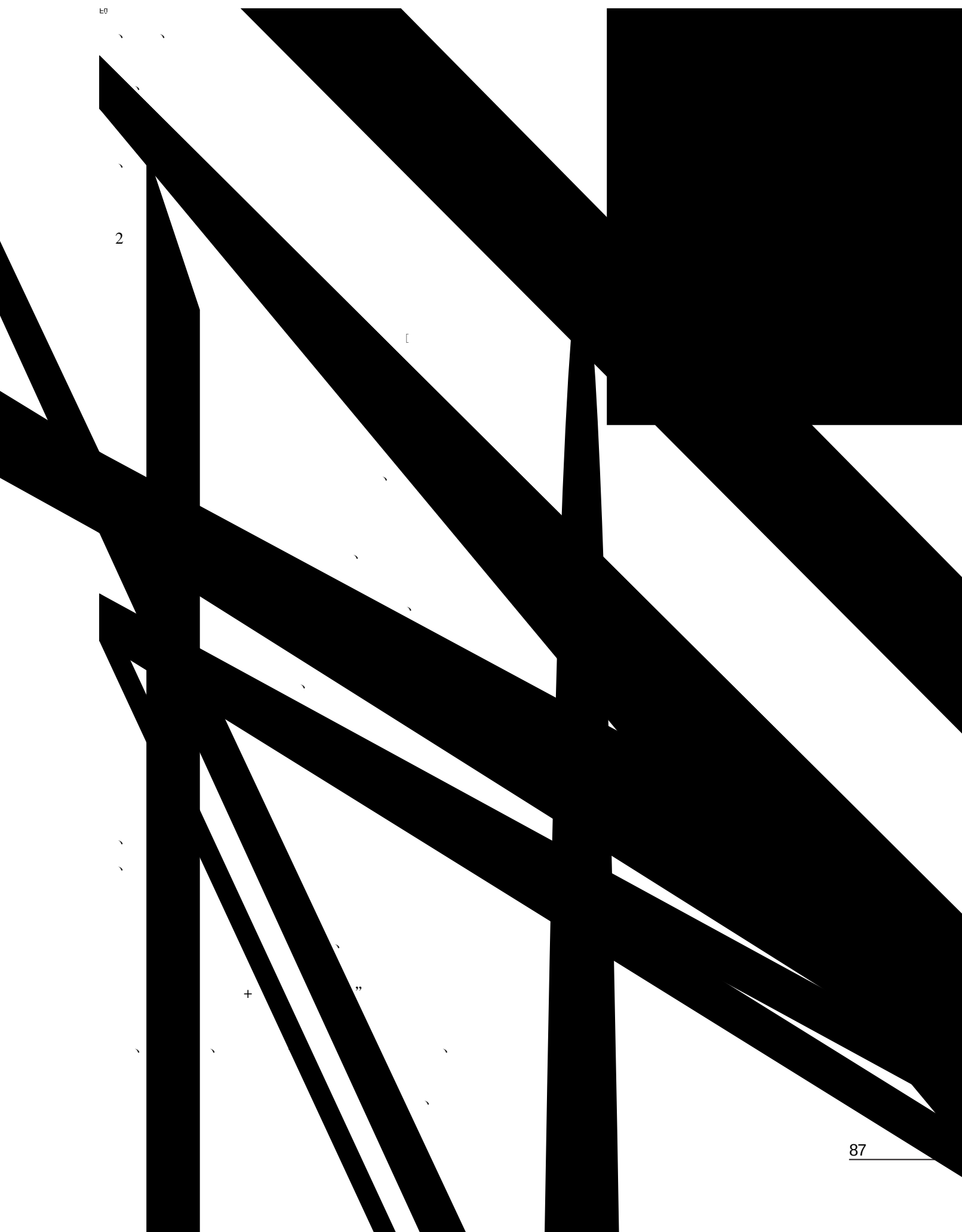
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Abstract The importance of scientific and technological information in supporting enterprise research and innovation has become increasingly prominent. This study systematically examines the core roles of S&T information in corporate innovation activities, highlighting its value in guiding innovation direction, supporting strategic decision-making, and enabling risk early warning. Based on practical investigations, the paper further identifies key challenges enterprises face in the acquisition, analysis, and application of S&T information, including difficulties in extracting high-quality information, insufficient analytical depth, and inadequate support for research and management decision-making. To address these issues, an intelligent S&T information system is constructed. The paper describes the design and implementation across multiple dimensions-including system architecture, data foundation, functional modules, and operational mechanisms-and illustrates how the system enhances th

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