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主要科研项目及代表性成果(包括项目、论文、专著、获奖、专利等)：

科研项目：

(1) 国家自然科学基金委员会，面上项目，52274223，诱发煤自燃基元反应路径及湿度影响机理研究，2023-01至2026-12，54万元，在研，主持.

(2) 国家自然科学基金委员会，面上项目，52074192，泡沫酶功能化特性及抑制煤自燃的机理研究，2021-01至2024-12，58万元，在研，主持.

(3) 国家自然科学基金委员会，青年项目，51304146，防治煤储运中粉尘的泡沫溶胶及单动力发泡装备的特性研究，2014-01至2016-12，25万元，已结题，主持.

(4) 天津市科学技术局，重大专项，18ZXAQSF00020，防治化工园区易燃液体流淌火的多态泡沫及其单动力应用技术研究，2018-10至2021-09，50万元，已结题，主持.

(5) 天津市科学技术局，重点研发计划项目，18YFJLCG00140，高性能环保型胶体泡沫及其单动力制备装置的应急救援灭火系统，2018-10至2021-09，25万元，已结题，合作单位主持.

(6) 天津市科学技术局，一般项目，19JCYBJC23000，抑制粉尘的多态泡沫胶及其应用装备技术研究，2019-04至2022-03，10万元，已结题，主持.

(7) 天津市科学技术局，一般项目，15JCYBJC22900，抑制粉尘的胶体泡沫及其应用装备技术研究，2015-05至2017-04，10万元，已结题，主持.

(8) 天津市津南区科技计划局，科研补贴项目，20161516，空气水性泥浆泡沫防治火灾的技术研究，2016-12至2017-12，20万元，已结题，主持.

代表性论文、著作、专利等：

➢ 学术论文：

(1) **Zhilin Xi**, Tong Xia, Liliang Shen, Lianquan Suo. Synthesis of cardanol grafted hydrophilic polymers and its mechanism of coal dust inhibition. ***Fuel*** 2023,345(19):128112

(2) **Zhilin Xi**, Ke Xi, Linping Lu, Mengmeng Zhang. Study on oxidation characteristics and conversion of sulfur-containing model compounds in coal. ***Fuel***2023,331(1):125756.

(3) **Zhilin Xi**, Mengmeng Li, Linping Lu, Lianquan Suo. Mechanism of MnSOD removing peroxy radical for inhibiting coal. ***Fuel*** 2022,325 (23): 124967.

(4) **Zhilin Xi**, Ke Xi, Linping Lu, Xue Li. Investigation of the influence of moisture during coal self-heating. ***Fuel*** 2022,324(20):124581.

(5) **Zhilin Xi**, Mengmeng Li, Xue Li, Linping Lu, Jiawei Wang. Reaction mechanisms involving the hydroxyl radical in the low-temperature oxidation of coal. ***Fuel*** 2022, 314(10): 122732.

(6) **Zhilin Xi**, Xue Li, Ke Xi. Study on the reactivity of oxygen-containing functional groups in coal with and without adsorbed water in low-temperature oxidation. ***Fuel*** 2021,304(23): 121454.

(7) **Zhilin Xi**, BangXin Jin, Ze Shan. Reaction mechanisms involving peroxy radical in the low-temperature oxidation of coal. ***Fuel*** 2021,300(19):120943.

(8) **Zhilin Xi,** BangXin Jin, Longzhe Jin, Meitong Li, Shanshan Li. Characteristic analysis of complex antioxidant enzyme inhibitors to inhibit spontaneous combustion of coal. ***Fuel,*** 2020, 267(9):117301.

(9) Yi Lu, **Zhilin Xi**, BangXin Jin, Meitong Li, Changxing Ren. Reaction mechanism and thermodynamics of the elimination of peroxy radicals by an antioxidant enzyme inhibitor complex. ***Fuel,***2020, 272(9):117719.

(10) **Zhilin Xi**, Xiaodong Wang, Meitong Li, Xiaoli Wang. Characteristic analysis of pulverized coal combustion. ***Combustion Science and Technology***, 2021, 193(9):1605-1622.

(11) **Zhilin Xi**, Ke Gao, Xiangyu Guo, Meitong Li, Changxing Ren. Mechanistic study of the inhibition of active radicals in coal by catechin. ***Combustion Science and Technology***, 2021, 193(11):1931-1948.

(12) **Zhilin Xi**, Ze Shan, Meitong Li, Xiaodong Wang. Analysis of coal spontaneous combustion by thermodynamic methods. ***Combustion Science and Technology***, 2021, 193(13):2305-2330.

(13) **Zhilin Xi**, Shuhui Zhou, Longzhe Jin. Experimental investigation of self-hardening foam-sol for controlling diffusion of static coal dust. *Powder Technology*,2019, 345(5):274–282.

(14) **Zhilin Xi**, Xiaodong Wang, Xiaoli Wang, Li Wang, Ding Li, Xiangyu Guo, Liwei Jin. Self-hardening thermoplastic foam for the inhibition of coal oxidation at low temperatures. *Combustion Science and Technology*, 2019,191(11):1942-1959.

(15) **Zhilin Xi**, Xiaodong Wang, Xiaoli Wang, Li Wang, Ding Li, Xiangyu Guo, Liwei Jin. Polymorphic foam clay for inhibiting the spontaneous combustion of coal. *Process Safety and Environment Protection*, 2019,122(2):263-270.

(16) **Zhilin Xi***, Xiangyu Guo, J.Y. Richard Liew. Investigation of thermoplastic powder synergizing polymorphic foam to inhibit coal oxidation at low temperature. *Fuel*,2018,226(16):490-497

(17) **Zhilin Xi**, Liwei Jin, J.Y. Richard Liew, Ding Li. Characteristics of foam sol clay for controlling coal dust. *Powder Technology*, 2018, 335(13):401–408

(18) **Zhilin Xi**, Ding Li, Zhenya Feng. Characteristics of polymorphic foam for inhibiting spontaneous coal combustion. *Fuel*,2017, 206(20):334-341

(19) **Zhilin Xi**, Zhenya Feng, Ang Li. Synergistic coal dust control using aqueous solutions of thermoplastic powder and anionic surfactant. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*,2017,520(9): 864–871.

(20) **Zhilin Xi**. Experimental investigation of the innovative foaming device using gas as the sole power for firefighting. *Process Safety Progress*, 2017,36(2):150–157.

(21) **Zhilin Xi**, Xutong Sun. Effectiveness of thermoplastic powder to retard self-heating and

spontaneous combustion of coal. *Combustion Science and Technology*, 2016,188(8):1331-1344.

(22)**Zhilin Xi**, Ang. Li. Characteristics of thermoplastic powder in an aqueous foam carrier for inhibiting spontaneous coal combustion. *Process Safety and Environmental Protection*. 2016,104(7):268-276.

(23)**奚志林**,李晶,范冰倩,泡沫溶胶抑制静态煤尘特性及其应用技术的试验研究,煤炭学报, 2015,40(s1):126-131.

(24)**Zhilin Xi**, Manman Jiang, Changping Sun, Xian Tu. Controlling the coal dust at transshipment point: a study of the foam-sol foaming device. *International Journal of Mining Science and Technology*, 2014,24(5): 625-630.

(25)**Zhilin Xi**, Manman Jiang, Jinjun Yang, Xian Tu. Experimental study on advantages of foam-sol in coal dust control. *Process Safety and Environmental Protection*, 2014,92(6): 637-644.

- **授权发明专利：**

(1) **奚志林**,单泽,靳邦鑫,张紫尧.一种用于测试多态泡沫控制流淌火的试验装置,2022.9.27,中国, ZL. 202010008914.8

(2) **奚志林**,靳邦鑫,单泽,张紫尧.一种用于测试抑制剂控制静态粉尘效果的实验装置,2022.3.16, 中国, ZL. 202010009046.5

(3) **奚志林**,单泽,靳邦鑫.一种制备泡沫的泡沫发生器,2021.8.10,中国, ZL. 202010009047.X (国内发明专利)

(4) **Xi Zhilin**, Li Xue, Yan Xingyue. Device for preparing air water-based foam based on pneumatic mode. 2020.11.29, Australian innovation. 2020103764.

(5) **Xi Zhilin**, Shan Ze, Jin Bangxin. Foam Generator for Preparing Foam.2020.4.15, Australian innovation.2020100567.

(6) **奚志林**.一种用于制备泥浆泡沫的产泡装置, 2018.2.2, 中国, ZL. 201610152363.6

(7) **奚志林**,冯真雅. 一种单动力产泡装置, 2017.10.3,中国,ZL 201610013564.8.

(8) **奚志林**,李彭辉,范冰倩,李晶.一种用于测试泡沫溶胶抑制粉尘效果的实验装置,2016.8.24,中国,ZL 201410498569.5.

(9) **奚志林**,沈介雨.一种用于测试泡沫溶胶吸附粉尘的实验装置,2014.11.5, 中国,ZL.201310015928.2

(10) **奚志林**,张嘉珙,杨进军,黄高建.控制传送带转载点煤尘的锥形喷射泡沫溶胶发生装置,2014.8.6,中国,ZL.201210333011.2

- **授权实用新型专利：**

(1) **奚志林.**一种制备水性泡沫的储液装置,2022.5.13, 中国, ZL.202122917075.4.

(2) **奚志林.**一种单一动力的水性泡沫制备装置,2021.11.19, 中国, ZL.202121059529.2.

人才称号:

(1) 天津市特聘教授青年学者，2019 年

(2) 天津市高校“中青年骨干创新人才”，2019 年

(3) 天津市“131”创新型人才培养工程第二层次，2017 年

(4) 天津市“131”创新型人才培养工程第三层次，2013年

主要获奖：

(1)奚志林(8/12)；红土镍矿湿法冶炼废渣高值化综合利用与资源化关键技术及应用，天津市人民政府，天津市科学技术进步奖，一等奖，2020.

(2)奚志林(1/5)；多态泡沫成套系统抑制动、静态煤尘的关键技术与应用，中国职业安全健康协会，科学技术奖，三等奖，2022.