



## Xin Meng

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### Profile

Xin MENG received his Ph. D. in Chemical Engineering from East China University of Science and Technology (ECUST) in 2007, then taught in the same university. She became an associate professor in 2010. From 2016 to 2017, she worked in University of Wisconsin-Madison as a visiting scholar. She is a young editorial board member of "China Plastics" journal, an expert of the National Natural Science Foundation of China and the Natural Science Foundation of Hebei Province, and serves as an excellent graduate instructor of ECUST. She has presided over more than 20 enterprise and government projects, including 863 projects of Ministry of Science and Technology, Youth and General program of National Natural Science Foundation of China. She received several rewards, one provincial and ministerial-level technical invention award, two scientific and technological progress awards, and one provincial and ministerial-level educational and teaching achievement award. She has published more than 50 research papers, obtained 4 authorized patents, and 2 co-edited textbooks.

### Research Field

- 1.Regulation of degradable materials performance based on additives and polymer topology design.
- 2.Computational simulation-assisted degradation and stabilization process of degradable materials.
- 3.Computational simulation-assisted optimal design of nucleation systems for high-performance polyolefins and industrial applications.
- 4.Design of non-homogeneous catalysts based on carbon conversion.

### Research results and main published thesis

Representative papers:

(I) Performance regulation of PLA, PGA and other degradable materials

- 1) Chenyang Li, Xin Meng\*, Weiguang Gong, Shiyuan Chen, Zhong Xin\*\*. Kinetic, products distribution, and mechanism analysis for the pyrolysis of polyglycolic acid toward carbon cycle. *Fuel*. 2023, 333(2): 126567.
- 2) Zhongyang Yao, Weiguang Gong, Chenyang Li, Zhaopeng Deng, Yi Jin, Xin Meng\*. Sustained antioxidant properties of epigallocatechin gallate loaded halloysite for PLA as potentially durable materials. *Journal of Applied Polymer Science*. 2023 · 140(5) : e53411.
- 3) Chenyang Li, Weiguang Gong , Zhaopeng Deng, Zhongyang Yao, Xin Meng \*, Zhong Xin\*\*. Full biodegradable long-chain branched polylactic acid with high crystallization performance and heat resistance. *Industrial and Engineering Chemistry Research*.2022,61(30):10945-10954.
- 4) Xiaolong Wang, Weiguang Gong \*, Xin Meng, Chenyang Li, Jin Gao. Preparation of a biobased core-shell flame retardant and its application in polylactic acid. *Journal of Applied Polymer Science*.2022 · 139 : ( 31 ) e52720.
- 5) Chenyang Li, Weiguang Gong, Qiming Cao, Zhongyang Yao, Xin Meng \*, Zhong Xin\*\*. Enhancement of cardanol-loaded halloysite for the thermo-oxidative stability and crystallization property of polylactic acid. *Applied Clay Science*. 2022, 216: 106357.
- 6) Chenyang Li, Qiang Liu, Weiguang Gong, Zhou Zhou, Zhongyang Yao, Xin Meng\*. Study on the atomic scale of thermal and thermo-oxidative degradation of polylactic acid via reactive molecular dynamics simulation. *Thermochimica Acta*. 2022 · 709 : 179144 .
- 7) Zhongyang Yao, Qiming Cao, Chenyang Li, Weiguang Gong,Xin Meng\*. Improvement of  $\beta$ -cyclodextrin/cardanol inclusion complex for the thermal-oxidative stability and environmental-response antioxidation releasing property of polylactic acid. *Polymers for Advanced Technologies*.2022,33:492-504.
- 8) Weiguang Gong, Min Fan, Ji Luo, Juan Liang, Xin Meng\*. Effect of nickel phytate on flame retardancy of intumescent flame retardant polylactic acid. *Polymers for Advanced Technologies*.2021,32:1548-1559.
- 9) Qiming Cao, Xin Meng\*, Shuhang Tan, Zhong Xin, Lih-Sheng Turng, Jie Li · Zhongyang Yao, Zihang Zhai · Runzi Duan. Electrospun bead-in-string fibrous membrane prepared from polysilsesquioxane-immobilising poly(lactic acid) with low filtration resistance for air filtration. *Journal of Polymer Research*. 2020, (27):5.
- 10) Ji Luo , Xin Meng\*, Weiguang Gong, Zewen Jiang, Zhong Xin. Improving the stability and ductility of polylactic acid via phosphite functional Polysilsesquioxane. *RSC Advances*. 2019, 9: 25151-25157.
- 12) Xin Meng, Guotao Shi, Chushi Wu,Wei jie Chen, Zhong Xin, Yaoqi Shi · Yansheng. Chain extension and oxidation stabilization of triphenyl phosphite (TPP) in PLA. *Polymer Degradation and Stability*.2016,124 ( 2 ) : 112-118.
- 13) Xin Meng, Guotao Shi, Weijie Chen, Chushi Wu, Zhong Xin, Ting Han, Yaoqi Shi. Structure effect of phosphite on the chain extension in PLA. *Polymer Degradation and Stability*.2015,120 ( 10 ) : 283-289.
- 14) Ting Han, Zhong Xin, Yaoqi Shi, Shicheng Zhao · Xin Meng · Hui Xu. Control of thermal degradation of poly(lactic acid) using polysilsesquioxane microspheres as chain extenders. *Journal of Applied Polymer Science*. 2015, 132 ( 20 ) : 41977-41987.

(II) Additives design based on PP performance modulation

- 1) Zhaopeng Deng, Xin Meng\*, Zhong Xin, Chengyang Li, Zhongyang Yao. Effects of halloysite nanotubes modified by organic phosphate on the performance improvement for polypropylene. *Journal of Applied Polymer Science*. 2023 · e53703.
- 2) Zhaopeng Deng, Chuangchuang Tong, Zhong Xin, Xin Meng \*, Min Fan, Weiguang Gong, Cheng Shu. Enhanced crystallization property and equilibrium mechanical properties of a novel self-assembly nucleating system based phosphate for polypropylene. *Journal of Polymer Research*. 2022, 29:297.
- 3) Jin Gao, Xin Meng \*, Zhaopeng Deng, Zhong Xin\*\*, Chuangchuang Tong. Enhancement of "in-situ" dispersed NA11 for the mechanical and crystallization properties of polypropylene. *Journal of Polymer Research*. 2022, 29: 168.
- 4) Chao Li, Chuangchuang Tong · Xin Meng\*, Zhong Xin\*, Yaoqi Shi. Effect of nucleating agent supported on zeolite via the impregnation on the crystallization ability of isotactic polypropylene and its mechanism. *Polymers for Advanced Technologies*. 2019; 30: 2674-2685.
- 5) Xin Meng\*, Chuangchuang Tong · Zhong Xin, Weiguang Gong, Yaoqi Shi · Weijie Chen and Yan Sheng. Promotion of zeolite as dispersion support for properties improvement of  $\alpha$  nucleating agent in polypropylene[J]. *Journal of Polymer Research*. 2019, 26(5):105.
- 6) Xin Meng, Weiguang Gong, Weijie Chen, Yaoqi Shi, Yan Sheng, Shengjie Zhu, Zhong Xin\*. Isothermal and non-isothermal crystallization of isotactic polypropylene in the presence of an  $\alpha$  nucleating agent and zeolite 13X. *Thermochimica Acta*.2018, 667(10):9-18.
- 7) Xin Meng, Zewen Jiang, Zhong Xin\*, Weijie Chen, Yan Sheng, Chushi Wu. Antioxidation and mechanism of phosphites including the free phenolic hydroxyl group in polypropylene. *Journal of Applied Polymer Science*. 2017, 134 ( 15 ) 446961.
- 8) Xin Meng · Zhong Xin · Xuefeng Wang. Structure effect of benzofuranone on the antioxidant activity in polypropylene. *Polymer Degradation and Stability*. 2010, 95 ( 10 ) : 2076-2081.

(III) Design of non-homogeneous catalysts

- 1) Bowen Xu, Xin Meng, Zhong Xin, Daoming Jin, Rui Zhao, Wenhua Dai, Fan Xu, and Dandan Yang.Effect of Mo Addition on Performance of Ni-based Methanation Catalysts Supported by Halloysites[J]. *Industrial & Engineering Chemistry Research* ( Accepted ) .
- 2) Rui Zhao, Xin Meng, Wenhua Dai, Daoming Jin, Bowen Xu, Fan Xu, Dandan Yang, Zhong Xin. Highly dispersed Fe/EG catalysts assisted by ammonium citrate andtheir application in CO<sub>2</sub> hydrogenation to olefins [J]. *Fuel*. 2023, 351: 128926.
- 3) Wenli Gao, Qiangfeng Yin, Xin Meng, Xuelian He, Zhong Xin. Excellent behaviors of highly dispersed Ni-based catalyst in CO methanation synthesized by in-situ hydrothermal method with carbon quantum dots assisted[J]. *Fuel*. 2022, 310: 121813-121823.
- 4) Daoming Jin, Xin Meng, Wenli Gao, Bowen Xu, Wenhua Dai, Rui Zhao, Fan Xu, Dandan Yang, and Zhong Xin. Effects of the template on low-silica SAPO-34 in a bifunctional catalyst for the direct conversion of syngas to light olefins. *Industrial & Engineering Chemistry Research*. 2023, 62(1): 211-222.
- 5) Bowen Xu, Xin Meng, Zhong Xin, Wenli Gao, Dandan Yang, Daoming Jin, Rui Zhao, and Wenhua Dai. A novel CO methanation catalyst system based on acid-etched natural halloysites as supports. *Industrial & Engineering Chemistry Research*. 2022, 61(36): 13328-13340.
- 6) Rui Zhao, Xin Meng, Qiangfeng Yin, Wenli Gao, Wenhua Dai, Daoming Jin, Bowen Xu, and Zhong Xin. Effect of precursors of Fe-based Fischer-Tropsch catalysts supported on expanded graphite for CO<sub>2</sub> hydrogenation[J]. *ACS Sustainable Chemistry & Engineering*. 2021, 9(46): 15545-15556.
- 7) Wenli Gao, Xin Meng, Daoming Jin, Bowen Xu, Wenhua Dai, Rui Zhao, Zhong Xin. Polyol-pretreated SBA-16 supported Ni-Fe bimetallic catalyst applied in CO methanation at low temperature[J]. *Molecular Catalysis*. 2021, 512: 111769-111781.

Authorized patents for inventions:

- 1) Xin Meng, Shengjie Zhu, Ji Luo, Juan Liang. A phosphate ester functionalized polysiloxane and its application in flame retardant biomass polyester materials. ZL 201911320489.X. Date of authorization: 9 April 2021 .
- 2) Xin Meng, Ji Luo, Weiguang Gong, Juan Liang, Xiaolong Wang. A flame retardant modified polylactic acid material. ZL 202010047416.4. Date of Authorization: 2 March 2021.
- 3) Zhong Xin, Bowen Xu, Xin Meng. A nickel-based catalyst, preparation method and its application.ZL 202110955213.X. Date of Authorization: 24 June 2022.
- 4) Xin Meng, Chenyang Li, Weiguang Gong. A high crystallization heat-resistant polylactic acid material and its preparation method. ZL 202111649992.7. Date of authorization: 17 Feb 2023.