

Summary reports 2022-2023 from Chinese Phase Diagram Committee

By Prof. Y. Du and Prof. M. Jiang

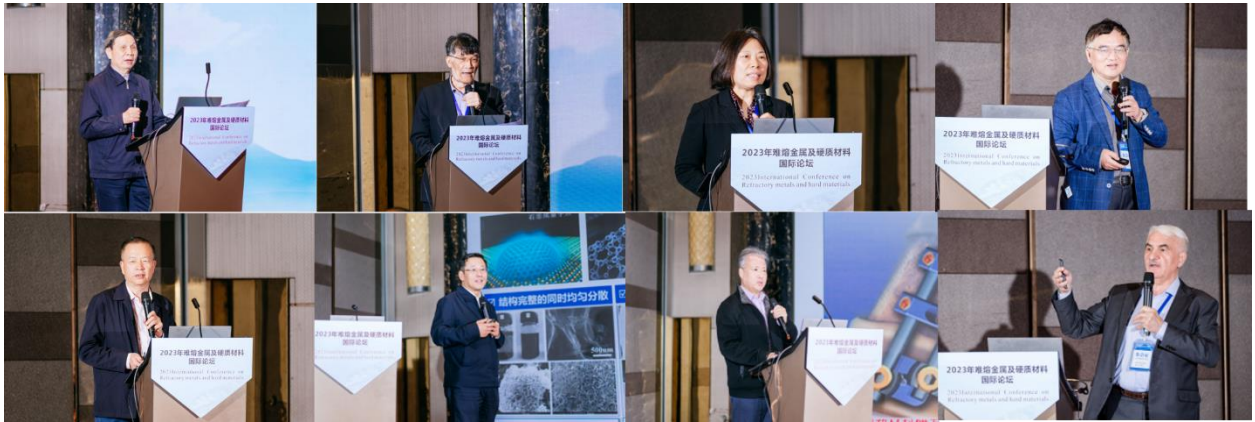
May 17, 2023

1. Activities with focus on phases diagrams, such as workshops, conference symposia or short courses: brief summary, weblink and/or program

Meeting: 2023 International Conference on Refractory Alloys and Hard Materials

From March 31 to April 2, the 2023 International Conference on Refractory Alloys and Hard Materials (RAHM), co-sponsored by the School of Materials Science and Engineering of Shandong University, the State Key Laboratory of Powder Metallurgy of Central South University, the Key Laboratory of Non-ferrous Materials and Engineering of the Ministry of Education of Central South University, and Hunan Boyun Oriental Powder Metallurgy Co., Ltd., was successfully held in Changsha, Hunan. Huang Boyun, academician of the CAE Member, Shi Dongmei, chief technical engineer of the High tech Research and Development Center of the Ministry of Science and Technology, Zhang Zhongjian, executive chairman of the Zhuzhou Cemented Carbide Industry Association, Du Yong, professor of Central South University, Yi Jianhong, vice president of Kunming University of Technology, Qu Xuanhui, professor of Beijing University of Science and Technology, Dong Chuang, professor of Dalian University of Technology, Xu Dongsheng, researcher of the Institute of Metals of the Chinese Academy of Sciences, Professor Zhang Li from Central South University and Professor Liu Yi from Shanghai University attended this forum. 178 experts and postgraduates from domestic and foreign universities, research institutes, and related enterprises attended the meeting. There were 10 invited reports, 49 oral reports, and 28 posters, explaining the achievements and cutting-edge trends in the field of refractory metals and hard materials from different research fields, and exploring the role of integrated computing materials engineering in promoting the progress and development of China's refractory metals and hard materials industry. 8 oral reports and 7 posters are about phase diagrams and thermodynamics in cemented carbides.

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China is a major country in the non-ferrous metal industry. As strategic metal elements and key industrial basic materials, refractory metals and hard materials have a wide and irreplaceable application demand. As the precursor and support for national economic construction and high-tech development, they are crucial for ensuring the healthy development of major national fields such as aerospace, energy transportation, equipment manufacturing, geological mining, and electronic information. In recent years, China has achieved leapfrog development and achievements in the fields of refractory metals and hard materials. As an important engine for high-quality development and progress in important fields, technological innovation will greatly enhance China's political and economic status and pattern in the world. The significance of this international Conference is to establish an international exchange platform for refractory metals and hard materials, and further promote the international influence of China's refractory metals and hard materials industry.

2. Representative publications from 2022 to May 2023 selected by Chinese Phase Diagram Committee

- 1) Yinping Zeng, Yong Du, and Rainer Schmid-Fetzer, "A novel computational framework to calculate Gibbs energy and phase transitions under external magnetic fields applied to the Bi–Mn system," *Acta Mater.*, 243, 118496-11 (2023).
- 2) Yinping Zeng, Tobias Mitnacht, Walter Werner, Yong Du, Daniel Schneider, and Britta Nestler, "Gibbs energy and phase-field modeling of ferromagnetic ferrite (α) \rightarrow paramagnetic austenite (γ) transformation in Fe–C alloys under an external magnetic field," *Acta Mater.*, 225, 117595-12 (2022).
- 3) Qiang Lu, Jianchuan Wang, Hongcheng Li, Shenbao Jin, Gang Sha, Jiangbo Lu, Li Wang, Bo Jin, Xinyue Lan, Liya Li, Kai Li, and Yong Du, "Synergy of multiple precipitate/1 matrix interface structures for a heat resistant high-strength Al alloy," *Nature Communications*, in press (2023) (Note: Use CALPHAD method to design alloy composition)
- 4) H.L. Peng, H.S. Liu, T. Voigtmann, "Nonmonotonic Dynamical Correlations beneath the Surface of Glass-Forming Liquids," *PHYSICAL REVIEW LETTERS*, 129(2022), 215501.
- 5) J. Peng, R.-C. Wang, M.-X. Zhu, Z.-M. Li, H.-S. Liu, A.K. Mukherjee, T. Hu, "2430% Superplastic strain in a eutectic Au-Sn alloy with micrometer-sized grains maintained by spinodal-like decomposition," *Acta Materialia*, 228 (2022) 117766.
- 6) Yanglin Wang, Min Jiang*, Runze Wang, Zunhong Wen, Hongxiao Li, Yuping Ren, Gaowu Qin, Au composition dependent order-disorder transitions of Fe – Pt intermetallic compounds: experiments and thermodynamic analysis, *Acta Materialia* (2022), doi: <https://doi.org/10.1016/j.actamat.2022.118058>.

3. Member roster

List of members of Chinese Phase Diagram Committee are as follows:

- Chu Maoyou, *General Research Inst. for Nonferrous Metals, Beijing*
- Cui Yuwen, *Nanjing Univ. of Tech., Nanjing*
- Dong Chuang, *Dalian Univ. of Tech., Dalian*
- Du Yong, *Central South Univ., Changsha*
- Du Zhenmin, *Univ. of Sci. & Tech. Beijing, Beijing*
- Jiang Min, *Northeastern Univ., Shenyang*
- Li Changrong, *Univ. of Sci. & Tech. Beijing, Beijing*
- Li Guobao, *Peking Univ., Beijing*
- Li Jingbo, *Beijing Univ. of Tech., Beijing*

- Li Junqin, *Shenzhen Univ., Shenzhen*
- Liu Huashan, *Central South Univ., Changsha*
- Liu Libin, *Central South Univ., Changsha*
- Liu Xingjun, *Xiamen Univ., Xiamen*
- Liu Yuqin, *China Univ. Geosciences, Beijing*
- Lu Xiaogang, *Shanghai Univ., Shanghai*
- Ouyang Yifang, *Guangxi Univ., Nanning*
- Qin Gaowu, *Northeastern Univ., Shenyang*
- Song Xiaoyan, *Beijing Univ. of Tech., Beijing*
- Su Xuping, *Changzhou Univ., Changzhou*
- Sun Lixian, *Guilin Univ. of Electron. Tech., Guilin*
- Wang Bowen, *Hebei Univ. of Tech., Tianjin*
- Wang Cong, *Beihang Univ., Beijing*
- Wang Cuiping, *Xiamen Univ., Xiamen*
- Xing Xianran, *Univ. of Sci. & Tech. Beijing, Beijing*
- Yan Jialin, *Guangxi Univ., Nanning*
- Yin Fucheng, *Xiangtang Univ., Xiangtan*
- Zhang Zhidong, *Inst. of Metals, CAS, Shenyang*
- Zhao Jingtai, *Shanghai Univ., Shanghai*
- Zhou Weiya, *Inst. of Phys., CAS, Beijing*