Journal of
Chemical Biology & Pharmaceutical Chemistry

Abstract

Investigation on the reaction characteristics of a Zr-based metallic glass

Chuan Ting Wang
Nanjing University of Science & Technology, China

Abstract:

The dynamic fragmentation and reaction behavior of ZrCuNiAl bulk metallic glass (BMG) was investigated by using of a quasi-sealed chamber. A series of impact tests were conducted via launching ZrCuNiAl BMG specimens into the test chamber filled with air or argon (Ar). The results demonstrated that in air atmosphere the ZrCuNiAl metallic glass experienced chemical reaction after impacting the target, the energy released by such reaction caused significant over-pressure inside the chamber. The reaction was related to the fragmentation and the critical fragment size for reaction was determined by scanning electron microscope (SEM) images; In Ar atmosphere, the fragment distribution of ZrCuNiAl BMG was following a power-like function. A model was established by combining the dynamic fracture distribution with chemical reaction of ZrCuNiAl BMG can predict the quasi-pressure inside the chamber under a certain range of velocities with acceptable accuracy.

Biography:

Chuan Ting Wang has completed his PhD from University of Southampton, UK and postdoctoral studies from University of Southern California. He is currently an associate professor of Nanjing University of Science and Technology. He has published more than 25 papers in reputed journals.

Publication of speakers:

1. Wang, Chuan & He, Yong & Ji, Cheng & He, Yuan & Han, Wei & Pan, Xuchao. (2017). Investigation on shock-induced reaction characteristics of a Zr-based metallic glass. Intermetallics. 93. 10.1016/j.intermet.2017.11.004.
2. Zhou, Jie & He, Yuan & He, Yong & Wang, Chuan. (2017). Investigation on Impact Initiation Characteristics of Fluoropolymer-matrix Reactive Materials. Propellants, Explosives, Pyrotechnics. 42. 10.1002/prep.201700003.

3. Zhou, Jie & He, Yuan & He, Yong & Wang, Chuan. (2017). Cover Picture: Investigation on Impact Initiation Characteristics of Fluoropolymer-matrix Reactive Materials (Prop., Explos., Pyrotech. 6/2017). Propellants, Explosives, Pyrotechnics. 42. 573-573. 10.1002/prep.201780601.
4. Ji, Cheng & He, Yuan & Wang, Chuan & He, Yong & Pan, Xuchao & Junjie, Jiao & Guo, Lei. (2016). Investigation on shock-induced reaction characteristics of an Al/Ni composite processed via accumulative roll-bonding. Materials & Design. 116. 10.1016/j.matdes.2016.12.002.
5. Ji, Cheng & He, Yong & Wang, Chuan & He, Yuan & Xiong, Wei & Zhang, Xian & Zhou, Jie & Gu, Lei & Yang, Xiang & Pan, Xu. (2016). Shock-Induced Reaction Characteristics of an Al/Ni Composite Processed via Accumulative Roll-Bonding. Materials Science Forum. 879. 2044-2049. 10.4028/www.scientific.net/MSF.879.2044.
6. Wang, Chuan & Hakala, Timo & Laukkanen, Anssi & Ronkainen, Helena & Holmberg, Kenneth & Gao, Nong & Wood, Robert & Langdon, Terence. (2016). An investigation into the effect of substrate on the load-bearing capacity of thin hard coatings. Journal of Materials Science. 51. 10.1007/s10853-016-9751-8.

Citation: Chuan Ting Wang; Investigation on the reaction characteristics of a Zr-based metallic glass; Euro Materials 2020; August 27, 2020; London, UK