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Effects of Y2O3, Ti, and forming processes on ODS-iron based alloy

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Y 2O3 dispersion strengthened iron-based powders and oxide dispersion strengthened (ODS) alloy were prepared by hydrothermal synthesis and spark plasma sintering (SPS) respectively. The effects of Y2O3, vibratory milling treatment and Ti element on the microstructure and mechanical properties of the materials were investigated by Scanning Electron Microscope (SEM) and micro-electronic universal tester. The results showed that the best mechanical properties were obtained with 1 wt % Y2O3 addition. The size of agglomerated particles could be decreased to a certain degree by vibratory milling treatment. With the addition of Ti element, the tensile strength and hardness of the samples were improved.

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