Supplementary materials

Composition and Temperature Influence on Hydrogenation Performance of $TiZrHfMo_xNb_{2-x}$ High Entropy Alloys

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The characteristic $f(\alpha)$- t/lnt curves of $TiZrHfMo_xNb_{2-x}$ (x = 0, 1, 2) HEAs for hydrogen absorption at high-temperatures are as shown in Fig. S2-S4. Among those four typical models, the Jonhson-Mehl-Avrami-Kolomogorov (JMAK) models of nucleation-growth-impingement models have the best linearity.

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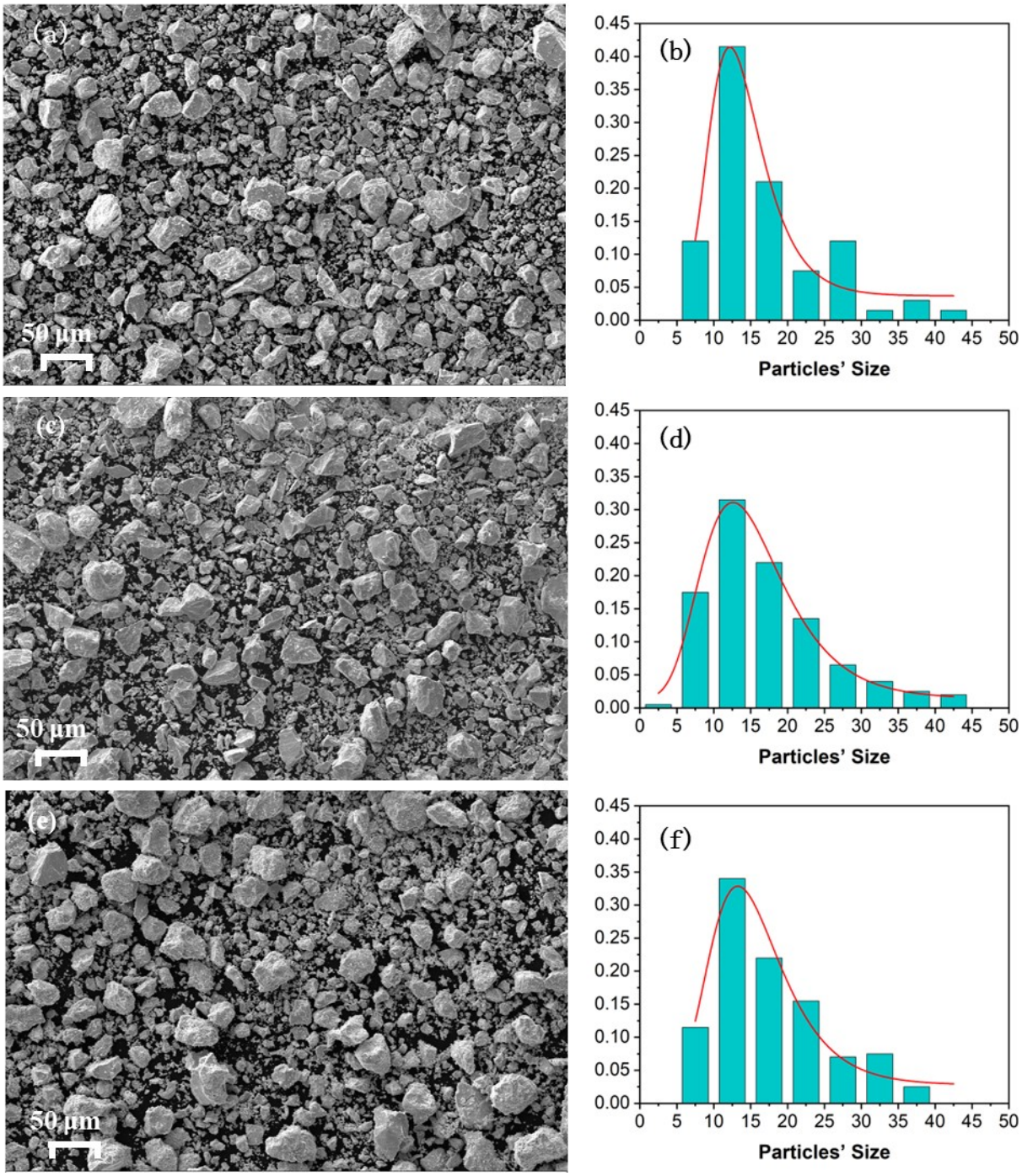

Fig. S1 (Color online) (a)The SEM image and statistic distribution of particle size of of $TiZrHfMo_xNb_{2-x}$ ((a) (b): $x = 0$, (c) (d): $x = 1$, (e) (f): $x = 2$) HEAs powders after first activation, then fully desorption and grinding.

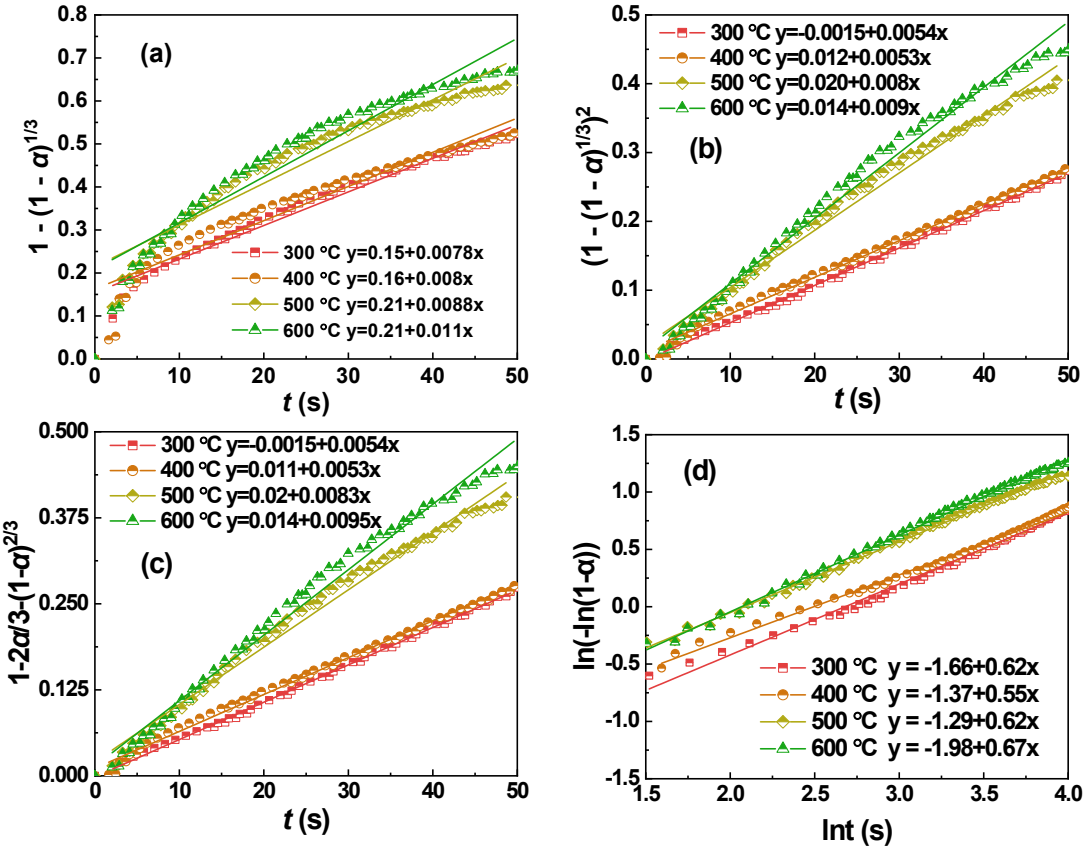

Fig. S2 (Color online) The characteristic $f(\alpha)$- t/lnt curves of $TiZrHfNb_2$ HEA for hydrogen absorption at four kinds of temperatures. The kinetic fitting curve based on: (a) Contracting Volume (CV), (b) 3-D diffusion-Jander (Jander), (c) Ginstling-Broundshtein (G-B), (d) Jonhson-Mehl-Avrami-Kolomogorov (JMAK).

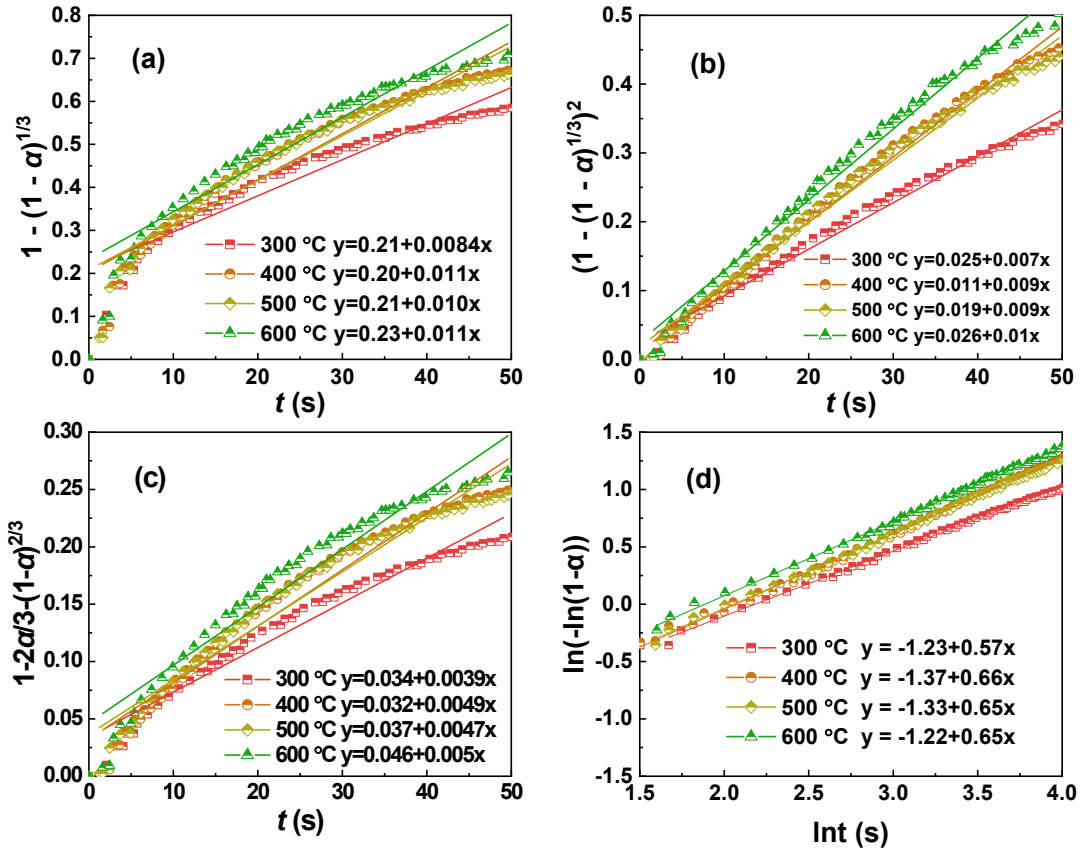

Fig. S3 (Color online) The characteristic $f(\alpha)$- t/lnt curves of TiZrHfMoNb HEA for hydrogen absorption at four kinds of temperatures. The kinetic fitting curve based on: (a) CV, (b) Jander, (c) G-B, (d) JMAK.

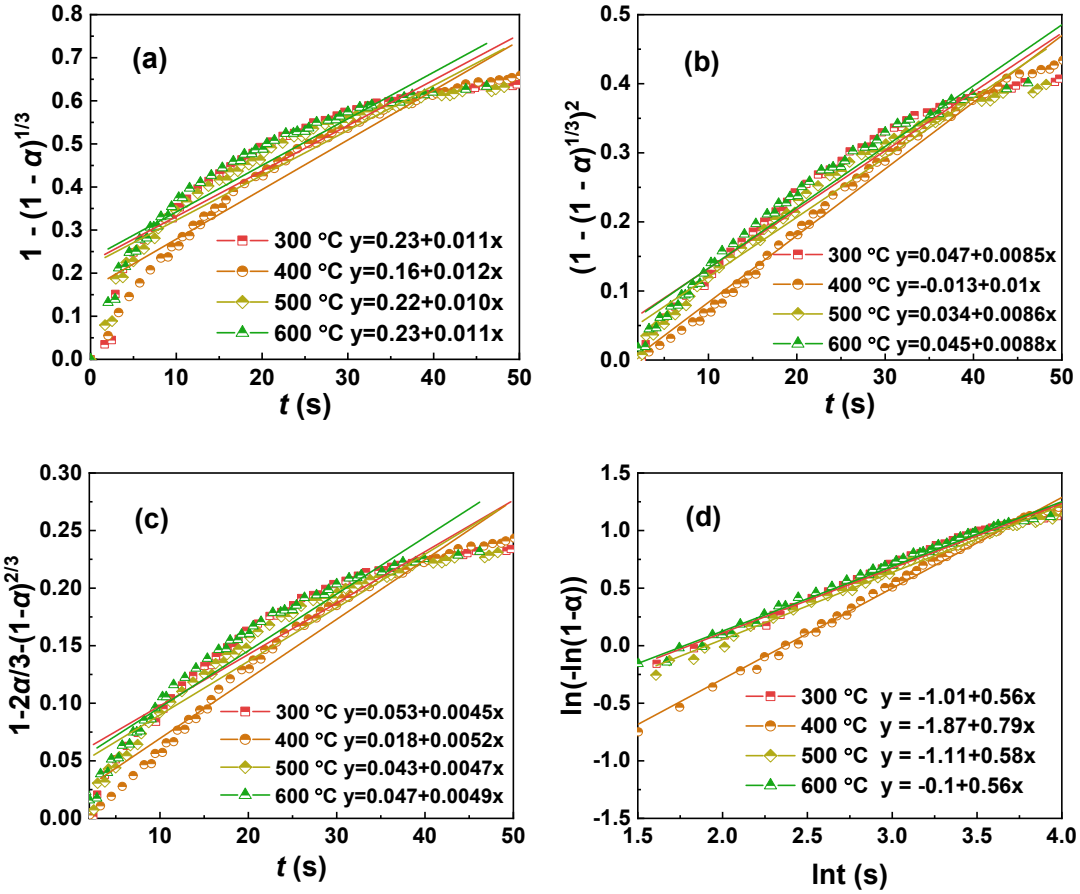

Fig. S4 (Color online) The characteristic $f(\alpha)$- t/lnt curves of $TiZrHfMo_2$ HEA for hydrogen absorption at four kinds of temperatures. The kinetic fitting curve based on: (a) CV, (b) Jander, (c) G-B, (d) JMAK.