

## 過冷メルトからの準安定相生成

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### Meta-stable Phase Formation from the Undercooled Melt

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#### Abstract

The meta-stable phase formed from the undercooled melt was reviewed in metallic and oxide materials. Three different conditions have to be satisfied for the meta-stable phase to be formed from the undercooled melt. The first one is deep undercooling below the hypothetical melting temperature of the meta-stable phase. The second one is the solid-liquid interface energy of the meta-stable phase to be less than that of the stable phase. The last one is that the growth velocity of the meta-stable phase is larger than that of the stable phase. In Fe-based alloys without the  $\gamma$  loop such as  $\text{Fe}_{76}\text{Ni}_x\text{Mo}_{24-x}$ , the meta-stable  $\delta$  phase can be formed when the melt of hyper-eutectic composition is undercooled below the critical temperature where the energy barrier for the critical nucleus of the  $\delta$  phase to be formed is less than that of the  $\gamma$  phase. In rare-earth ferrites such as  $\text{YFeO}_3$ , the meta-stable phase can be formed provided that the same conditions as those in the metallic materials are satisfied.