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Nano-functional structural materials designed by metastable phase

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Alloy's phases in a metastable state are constructed of unique structures characterized by tweed shape in nano-scale. It is quite different from the normal alloy lattice and dislocated style. The tweed structure should be formed within elastic distortion, and shaped in nano-scale contour. Also, it may be useful to nano structural function as like nano-precipitation for high strengthening and quantum dot-like structure. The tweed structure could be interpreted by pre-martensitic mechanism, which is pretty similar to ones of superconductor and Piezo-electric materials just commonly in metastable state. The unique characteristic of metastable phase in metal alloys is controversy electric resistance on temperature. We have studied about the metastable phases of various alloys as like Titanium, shape memory and superconductor alloys and the application of the nano-structure would be surveyed for functional and structural materials. The mechanism of the nano-structure may be analyzed also by Abinitio (1st principle), and we will introduce it for the analytical presentation.

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