

# Thermodynamic Properties, Mechanical Properties and Interatomic Potential in Solids. A Shou-Shi-Ling (手令) Game

Haiyan Fan<sup>1</sup> and Enrico Benassi<sup>2</sup>

<sup>1</sup>Nazarbayev University

<sup>2</sup>Shihezi University

April 28, 2020

## Abstract

Two formulae were developed to express sublimation enthalpy and Young's modulus on a thermodynamic basis. The first formula reveals how the sublimation enthalpy is correlated with the thermal expansion coefficient and heat capacity of solids, whereas the second formula relates the Young's modulus with sublimation enthalpy and equilibrium interatomic (intermolecular) distance. These two formulae provide alternative ways to quantitatively estimate thermodynamic or mechanical properties of great importance in the development of new materials.

## Hosted file

ThermMechPot\_2020-04-24-20.pdf available at <https://authorea.com/users/316300/articles/446455-thermodynamic-properties-mechanical-properties-and-interatomic-potential-in-solids-a-shou-shi-ling-%E6%89%8B%E5%8B%A2%E4%BB%A4-game>

## Hosted file

MCP-graph1.docx available at <https://authorea.com/users/316300/articles/446455-thermodynamic-properties-mechanical-properties-and-interatomic-potential-in-solids-a-shou-shi-ling-%E6%89%8B%E5%8B%A2%E4%BB%A4-game>

## Hosted file

MCP-graph2.docx available at <https://authorea.com/users/316300/articles/446455-thermodynamic-properties-mechanical-properties-and-interatomic-potential-in-solids-a-shou-shi-ling-%E6%89%8B%E5%8B%A2%E4%BB%A4-game>