

Re-visiting the 'rule of mixture' used in materials with multiple constituting phases: a technical note on morphological considerations in austenite case study

Abstract :

This is a technical note highlighting a method on how to perform averaging the elastic properties. The drawback of the traditional rule of mixture (ROM) is briefly discussed. The technique considers the effect of morphology based on classical continuum mechanics, taking the advantages of fracture mechanics. As an example, a model that simulates the possible configuration of constituting phases commonly found in austenite microstructure is chosen. The result is compared with traditional ROM. It is found that although similar, the result is better due to the stress amplification that is accommodated in the method, unlike the traditional ROM, which merely considers only the volumetric ratio.