

## Undiluted Recycling of Aluminum Scrap Alloy Using Hume-Rothery's Rule

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### **ABSTRACT**

A new concept of an undiluted recycling of aluminum alloy containing high-Fe impurity has been proposed and discussed herein. The primary objective of this concept is to avoid the conventional addition of virgin aluminum, to the aluminum scrap for lowering the concentration of Fe impurity. Results have shown that the  $Al_5FeSi$  ( $\beta$ -phase) can be suppressed with minor alloying additions of some elements as per Hume-Rothery's criteria for solid solubility. The proposed concept has been validated by Stirling's approximation method.

### **KEYWORDS:**

Recycling; Aluminum alloy; Microstructure; Solidification; Metallurgy; Intermetallic alloys and compounds