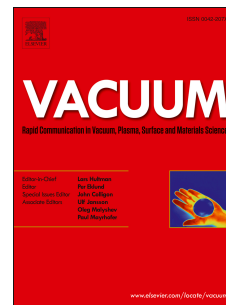


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A novel method of AlV55 alloy production by utilizing AlV65 alloy scrap

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1 A novel method of AlV55 alloy production by utilizing AlV65 2 alloy scrap

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18 **Abstract:** A novel recycling process was developed to produce vanadium aluminum
19 (AlV55) alloy using vanadium aluminum (AlV65) alloy scrap and aluminum (Al)
20 under vacuum. The theoretical calculation indicates that Al can be evaporated under
21 vacuum. Excessive Al would be consumed during melting process when the reaction
22 temperature ranges from 1823 to 2123 K, according to the theoretical calculation,
23 which indicates Al could evaporate under vacuum. The experimental results present
24 that Al was effectively dissolved in molten AlV65 alloy, the impurities (N, O, and C)
25 decreased and the content of V increased gradually with reducing Al addition.

26 **Keywords:** AlV65 scrap; aluminothermic reaction; AlV55 alloy; vacuum;

27 1 Introduction

28 Vanadium and vanadium alloys are consumed in steel industry, titanium alloy,
29 chemical industries and alloying agent [1-2]. Aluminum-vanadium alloys have been
30 widely applied in the military and civilian industry due to its high working
31 temperature, strong corrosion resistance and high specific strength [3-4]. Especially in
32 the titanium alloy field, aluminum and vanadium are the key elements. Al-V alloys

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