

THE PHASE DIAGRAM FOR NaK AT ATMOSPHERIC PRESSURE

Introduction

Several investigators have made thermal measurements on various sodium-potassium alloy compositions in an attempt to determine the solid-liquid equilibrium phase diagram for this system.¹⁻⁵ These early thermal investigations established the general boundaries of the various phases and identified the eutectic and a meritectically melting Na_2K compound. Measurements were made without the advantages of platinum resistance thermometry, high purity chemicals, and modern inert atmosphere facilities. The results, therefore, were understandably lacking in detail.

In particular, solid solubility limits were not reported in most of this earlier work. Bornemann⁶ suggested the existence of solid solutions in this system in 1909, but it was not until MacDonald's work⁷ using resistance measurements to plot the phase diagram that the extent of this solubility was even approximated. Rimai and Bloembergen⁸ have likewise established approximate solid solubility limits using the technique of nuclear magnetic resonance.