

Mat. Res. Bull. Vol. 2, pp.999-1008, 1967. Pergamon Press, Inc. Printed in the United States.

STABILITY OF CrO_2 AT HIGH PRESSURES AND TEMPERATURES
IN THE "BELT" APPARATUS

R. C. DeVries
General Electric Research and Development Center
Schenectady, New York

(Received August 29, 1967; Communicated by R. Roy)

ABSTRACT

An investigation of the decomposition of CrO_2 to Cr_2O_3 from 800° to 1580°C and 15 to 65 kb was made in the "belt" apparatus. CrO_2 can be held for at least 10 minutes without decomposition at temperatures to above 1500°C at pressures of 60 to 65 kb. These results indicate the feasibility of reacting other oxides with CrO_2 for the formation of new compounds.

Introduction

In order to carry out reactions at high temperatures for the synthesis of new compounds containing CrO_2 , it is necessary to contain this material at high pressures to prevent the decomposition to Cr_2O_3 . Since the "belt" apparatus is a convenient high-pressure unit for these kinds of reactions, a study was made to determine the stability limits of CrO_2 in that apparatus.

Kubota's original investigation (1) of the Cr-O system to pressures of about 1 kb and temperatures of about 600°C appears to have formed the basis for the selection of the 400° to 500°C