TABLE 4. THE ACTION OF CO_2-FREE WATER ON DOLOMITE, $CaCO_3 \cdot MgCO_3$

Temp., ° C.	$CaCO_3$, ppm	$MgCO_3$, ppm	$Mg(OH)_2$, ppm
25	4	3	
50	6	5.5	
80	8.6	7.3	
110	11	8	
130	13	7.8	
150	14.5	6	
200	18		11
225	17		10
250	15.5		8
300	12.5		4
340	7		1.5

$MgCO_3 + H_2O \rightleftarrows Mg(OH)_2 + CO_2$ began at about 150° C.; with dolomite it began a little higher, at 180° C. *X*-ray studies below 209° C. of material from the top of the reaction tube show only the dolomite patterns, but at 209° C. the pattern was of calcite and brucite. The results are in Table 4 and Fig. 3.

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SOME ALKALI ALUMINATE CRYSTALS AND POTASSIUM FERRITE

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The following alkali aluminate crystals were found in a study started about 1940 at the Geophysical Laboratory of the Carnegie Institution of Washington, but never completed.

At 130° C. the solid phase in equilibrium with a solution of the composi-

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tion H_2O 70.6%, Na_2O 15.4%, Al_2O_3 14%, under its own vapor pressure was gibbsite. The crystals in equilibrium with a solution of composition H_2O 56.7%, Na_2O 40.3%, Al_2O_3 3%, had the composition $Na_2O \cdot Al_2O_3 \cdot 3H_2O$ and were eight-sided tetragonal plates, uniaxial, negative, $\epsilon = 1.535$, $\omega = 1.535$. At 500° C. under a steam pressure of 100 atm crystals of anhydrous sodium aluminate, $Na_2O \cdot Al_2O_3$, were formed: optically (−), small 2V, $\alpha = 1.560$, $\gamma = 1.580$.

At 130° C. the compound $K_2O \cdot Al_2O_3 \cdot 3H_2O$ was obtained by dissolving Al_2O_3 in KOH in the molecular proportion $K_2O : Al_2O_3$ in an autoclave, under the vapor pressure of the solution. The crystals were long lath-like monoclinic, biaxial, negative, large 2V, $\alpha = 1.485$, $\gamma = 1.512$. At a little higher temperature, 150° C., its crystals had the composition $K_2O \cdot Al_2O_3 \cdot 2H_2O$, probably uniaxial, $\alpha = 1.510$, $\gamma = 1.518$, and at 370° C. the crystals had the composition $K_2O \cdot Al_2O_3 \cdot H_2O$, uniaxial (−), $\epsilon = 1.535$, $\omega = 1.550$. At 500° C. under a steam pressure of 100 atm, well-formed octahedral crystals of $K_2O \cdot Al_2O_3$ were formed, $n = 1.580$.

Under similar conditions at 500° C., using KOH and Fe_2O_3, ruby-red octahedral crystals of $K_2O \cdot Fe_2O_3$ were obtained, often in crystals several millimeters in diameter. They were rapidly attacked by atmospheric moisture and reacted with the index liquids.

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STUDIES ON MANGANESE OXIDE MINERALS
VI. THALLIUM IN SOME MANGANESE OXIDES[1]

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Introduction

The occurrence of unusual amounts of thallium in manganese ores from the Apache mine, Gila County, Arizona, was reported to the U. S. Geological Survey in 1943 by John Herman, of Smith-Emery Company, commercial analysts serving the Federal stockpile in Phoenix, Arizona. In June 1944, specimens from the Apache mine were included in a group of samples submitted to the laboratory by one of us (M.D.C.) to verify the presence of thallium and to determine the chemical nature of its occurrence. Spectrographic analysis by K. J. Murata of three samples from this mine showed that thallium was indeed present, in amounts estimated to be a few tenths of one per cent. The samples were set aside

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