

In view of the preceding considerations it is probable that for many purposes the California magnesite could not seriously compete with Canadian product in the eastern part of either United States or Canada, provided the Canadian deposits could supply the demand.

This memoir is a brief account of the results of an examination of the Grenville magnesite deposits made by the writer in the course of field work during the field season of 1916; supplemented in the introductory chapter by information of general interest to those engaged in the magnesite mining industry.

MAGNESITE.

Magnesite, the name usually applied to the carbonate of magnesia (MgCO_3) as found in nature, is a chemical compound consisting of 47.6 per cent oxide of magnesium, magnesia (MgO), and 52.4 per cent carbon dioxide (CO_2). It is somewhat heavier and harder than calcite, having a specific gravity of 3 to 3.12 and a hardness of 3.5 to 4.5. When free from impurities it has generally a brilliant snow white appearance, but in some of its occurrences, owing to the presence of disseminated impurities, it is yellow brown or grey in colour. Magnesite is almost insoluble in cold hydrochloric acid or sulphuric acid, but dissolves readily with effervescence in warm acids. When subjected to high temperatures a gradual decomposition of the mineral into magnesia and carbon dioxide takes place between temperatures of 300 and 600 degrees centigrade.¹ The resulting magnesia is exceedingly refractory, however, having a fusion point of approximately 2,500 degrees centigrade.²

Deposits of magnesite are widely distributed throughout the world and are generally regarded as belonging to one or other of two types, the massive or the crystalline. Massive magnesite, the most common type, is a fine-grained compact variety usually found in veins or masses in serpentine which has resulted from the alteration of magnesia-rich rocks of the peridotite family. To this group belong the Grecian deposits, nearly all the deposits in California, the recently discovered deposits in Bridge River district of British Columbia, and numerous other deposits found in various parts of the world. The crystalline variety of magnesite has been so named because of its coarsely crystalline texture. The principal deposits of this class, so far discovered, are those in Austria-Hungary

¹Brill, O., Ueber die Dissociation der Karbonate der Erdalkallen und des Magnesitumkarbonate, *Zeitschrift f. Anorg. Chem.* vol. 45, 1905, pp. 277-292.

Grunberg K., Beitrag. zur Kenntniss der natuerlichen kristallisierten Karbonate, des Calciums, Magnesiums, Eisens und Mangans. *Zeitschr. f. Anorg. Chem.*, vol. 80, 1911, p. 337.

²3000° C. according to Moissan.

1910° C. " " Goodwin-Malley, *Jour. Am. Electrochemical Soc.* vol. 9, 1906, p. 89.

2500° according to O. Ruff, *Zeitschr. Anorg. Chem.*, vol. 82, 1913, p. 373.

2800° " " C. W. Manolt, *Jour. Wash. Acad. Sc.*, vol. 3, 1913, p. 315.