Title	Magnesium From Olivine
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Society / Organization	AIME
Summary / Abstract	THE presence in the Tennessee Valley of extensive deposits of olivine, a silicate of magnesium and iron that contains approximately 28 per cent magnesium, has been recognized since 1896 when Lewis8 published a survey of basic magnesium rocks of western North Carolina. A recent field survey by T.V.A 7 showed that more than two hundred million tons of high-grade olivine occurs above local drainage levels in western North Carolina and northern Georgia. Except for sporadic attempts to work the olivine for its nickel and chromium contents,10 the ore received little attention industrially until 1926 when Goldschmidt3 suggested its use in the manufacture of refractories. Only one instance is recorded of an attempt to utilize the ore commercially for its magnesium content;" in this case a process was used in which olivine was treated with sulphuric acid, the resultant mixture was leached with water, and the leach solution was purified and evaporated to form epsom salts, which was the end product. As a part of its program of contributing to the development of the natural resources of the region, the Tennessee Valley Authority became interested in the olivine deposits as a source of metallic magnesium because of their high magnesium content and proximity to hydroelectric power. Studies were undertaken to determine the feasibility of producing magnesium chloride by extraction of olivine. The experimental work was carried out successively at the T.V.A. Minerals Testing Laboratory, Norris, Tenn., at the Georgia State Engineering Station,* Atlanta, Ga., and at the T.V.A. laboratory at Wilson Dam, Ala. The present paper describes a process, developed through the pilot-plant stage, whereby magnesium chloride suitable for reduction to metallic magnesium can be prepared from olivine by extraction with hydrochloric acid and subsequent purification. Research on the magnesium-from-olivine process, originally intended for peacetime use, was given impetus by the shortage of magnesium that existed at the beginning of the current world war. By the time the process was sufficiently developed to justify a proposal for its inclusion in the war program, the shortage had been met by expansion and development of other processes. However, it is believed that the magnesium-from-olivine process may have advantages that will warrant consideration of its use after the war, when the economics of the various processes rather than production on a wartime scale will be the criterion for commercial production of magnesium. DESCRIPTION OF PROCESS Metallic magnesium is produced electrolytically by the Dow and the Elektron
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