

bottle could go, and much of the feldspar market, too. Scrap glass, along with other collected wastes or incinerator residues, could conceivably be a secondary source of pre-processed feldspathic material. Both as a waste disposal and conservation measure, and as the possible base for a new industry, some attention to the subject is warranted.

Current beneficiation processes require thorough desliming of the ore prior to processing and prior to each flotation stage. This action, in addition to loss of feldspar values in tailings, results in losses as high as 50 percent. Additional losses are encountered when the concentrate is treated to remove iron minerals.

Decreasing availability of high quality potash feldspar and increasing demands for this product (used for high tension porcelain insulators and TV picture tubes) may make necessary development of a method for separating the potash and sodium minerals.

In common with other commodities derived mainly from surface workings, conflicts in land-use are potentially present and will tend to reduce the economic feasibility of production in many areas unless means of reconciling the interests without excessive costs are devised.

FLUORINE

The mineral fluorite is the common natural source of this commodity and the United States produces a quarter of its domestic demand for the mineral and consumes 35 percent of the world's supply. The domestic producing industry has exhibited considerable skill in surviving in a traditionally marginal economic atmosphere and the outlook for much growth in domestic fluorite production is not optimistic. While known world resources of fluorite are substantial, they are not sufficient to meet projected world demand. Thus, unless new discoveries are made or fluorine from materials other than the traditional fluorite ores (fluorspar) becomes competitive, world prices could rise. Therefore, some attention should be directed to opportunities for technologic improvement in the extraction and preparation of developed domestic fluorite sources and latent sub-marginal reserves.

Increased requirements for fluorspar flux in the basic oxygen steel furnaces, and rapidly expanded uses of fluorine in the uranium processing industry and the chemical industries will multiply the demand for fluorine by fourfold by the year 2000.

Large potential reserves of fluorine are present in phosphate rock. Approximately half of this is released in the manufacture of fertilizer and phosphoric acid. This has been considered a waste product and collected only for disposal purposes and to minimize air pollution. Some is now being recovered for commercial use. The extent of this resource and the interrelationship with other commodities, and the pollution issue in general, dictate that a priority should attach to more effective ways of extracting commercial fluorine products from ores likely to be mined primarily for another purpose.

GALLIUM

Compared to foreseeable needs both world and domestic resources are very large. Domestic production capability far exceeds demand. It is derived entirely in the processing of certain bauxites and zinc ores but trace quantities are also associated with coal. Quantities are so small that any conceivable increase in demand would have no effect on the extraction or processing cost of the primary substances or other coproducts. Gallium has some interesting and useful properties and research will broaden the areas of use for the metal and its compounds. The relative abundance of the element suggests that it might beneficially substitute for other substances of less abundance or higher cost in future use-patterns.

GARNET

Apparently the United States produces and consumes more than 90 percent of the world's supply. Domestic resources are very large. Except for minor problems stemming from the potential substitutability of and for other substances in abrasive applications, no aspect of the commodity demands particular attention.

The broad subject of abrasion, and the natural and synthetic substances that are employed in commercial applications of the property of abrasion, deserve attention from several aspects. For one thing, no good method for determining the effectiveness, acceptability, or relative performance of an abrasive exists and