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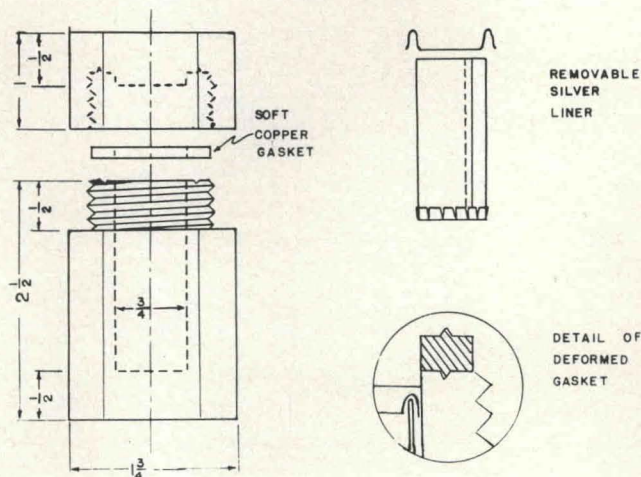
## A Simplified Bomb for Hydrothermal Synthesis

Hydrothermal procedures<sup>1,2,3</sup> have been used with considerable success to prepare a number of aluminosilicates, mixed oxides, and other compounds. Details of construction are presented for a simple bomb which costs less than \$10 and may be safely operated in the laboratory.

The bomb is fashioned from 216 stainless steel hexagonal stock and has a volume of approximately 10 ml. The threaded lid is tightened by means of a wrench while the bomb proper is held in a vise. A soft copper gasket deforms into grooves machined around both the lid and the lip, thus providing a gas-tight seal. The gasket, which can be used only once, is annealed prior to use by bringing it to red heat and quenching in water. The gaskets used in this laboratory were individually machined but can be obtained commercially.

For convenience in removal of the products and to prevent contamination of the sample, a liner may be used with the bomb. Shown is a removable silver liner made from 0.020 silver sheet, the seams of which are secured with silver solder. Platinum, copper, and glass liners have been used, but silver is most suitable for the alkali slurry used in the aluminosilicate preparations in this laboratory.

The bomb was used successfully in a dozen or more runs at temperatures up to 400°C with a one ml paste mixture of the required oxides. While the design of the bomb is such that it could withstand even greater pressures, it is suggested that some form of shielding be



used during the operation, such as surrounding the bomb and heater with concrete blocks and sand bags.

The construction of similar hydrothermal bombs has been described in the literature.<sup>1,4</sup>

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<sup>1</sup> BARRER, R. M., *J. Chem. Soc.*, 128, 1948.

<sup>2</sup> *Ibid.*, 1561, 1952.

<sup>3</sup> BURGESS, T. E., Ph.D. Thesis, University of Connecticut, 1960.

<sup>4</sup> SWINNERTON, A. C., OWEN, G. E., AND CORWIN, J. F. *Discussions Faraday Soc.*, 5, 172 (1949).