

kota, and Virginia. The greatest feldspar-producing region is that which includes the Atlantic Seaboard States, from Maine to North Carolina. This region reported about 91 per cent of the total output and value in 1930. North Carolina, the leading State, reported 60 per cent of the total output; Maine, the second State, reported 13 per cent; and New Hampshire, the third State, 10 per cent. The average value per long ton in North

Carolina was \$5.75; in Maine, \$7.11; and in New Hampshire, \$8.01.

Except for minor purposes, feldspar is prepared for use by grinding. This work is done principally by commercial mills; only a very small portion is ground by users in their own mills. In 1930 there were 34 commercial mills operated in 12 States, namely, California, Colorado, Illinois, Maine, New Hampshire, New Jersey, New York, North Carolina, Ohio, South Dakota, Tennessee, and Virginia.

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## NEW REFRIGERANT IS NON-INFLAMMABLE AND PRACTICALLY NON-POISONOUS

### Chlorine and Fluorine Feature in Compound

The recent development of a refrigerant known chemically as dichloro-difluoro methane promises to contribute greatly toward safety in automatic refrigeration. This compound is non-inflammable, in fact it could be effectively used to extinguish fires. It is also practically non-toxic.

In a study of the toxicity and possible detriment to health from inhaling vapors of this compound, the United States Bureau of Mines, Department of Commerce, at its Pittsburgh Experiment Station, has found that dogs, monkeys, and guinea pigs suffer no deleterious effects after being exposed to air containing as much as 20 per cent. of this vapor for 7 to 8 hours daily over a period of several weeks. Each day during the exposure the dogs and monkeys appeared to experience sensations of alcoholic intoxication, but they became normal in a minute or two after the exposure, and ate heartily. This sensation was also experienced by persons who breathed the gas; they also recovered in a minute or two without subsequent nausea or headache. The exceedingly high concentrations used in these experiments would be practically unattainable even in small kitchenettes in homes. Such atmospheres would be  $4\frac{1}{2}$  times as heavy as air and would flow away like water. In the study made by the Bureau of Mines it was necessary to build a gas-tight tank with the doors closing against rubber gaskets in order to build up the concentrations for experimental work.

The amount of dichloro-difluoro methane in air that would be required to cause death after several hours' exposure is about 300 to 500 times greater than the least toxic of the present day refrigerants. Lethal concentrations for short exposures, say 30 minutes, are not obtainable until enough of the vapor has been added to the air to dilute the oxygen to a concentration that will not support life.

In addition to the use of dichloro-difluoro methane in ordinary commercial and domestic refrigeration, this compound has possibility of wide use in cooling air for public buildings, perhaps in the near future for cooling the air of homes, and for cooling and conditioning the air of deep mines where earth temperatures prevent the deeper operations necessary to follow the ore vein. In all these cases contamination of the air with explosive or poisonous atmospheres would be more disastrous, and safety therefrom a matter of more important consideration than the potential hazards involved in ordinary refrigeration.