

The major manufacturers of glass-polishing agents are Mitsui Mining and Smelting Co., Ltd.; Tohoku Kinzoku Kagaku Co., Ltd.; Shin-Nippon Kinzoku Kagaku Co., Ltd.; and Seimi Chemical Co., Ltd.

Rare Earth Magnets (Samarium, Neodymium, Cerium, Praseodymium)

As Tables 30 and 31 show, rare earth magnet production has increased substantially in recent years.

Compared with 1987, rare earth magnet production in 1988 was up approximately 37 per cent to 1 071 tons. It is estimated that during 1988, production of Nd-Fe-B magnets substantially increased to some 300 tons, exceeding the production growth of Sm-Co magnets. Moreover, by taking into account the recent patent rights settlement between Sumitomo Special Metals and General Motors, Nd-Fe-B magnet production is likely to continue on its upward trend.

In 1988, Seiko Epson announced the successful development of a new Pr-Fe-B-Cu magnet which can be manufactured at relatively low cost. A unisotropic magnet, it is capable of a (BH)max of over 30MGOe. The market potential for this type of magnet is considerably high should product development reach the mass production stage.

Demand volume for samarium oxide stood at 370 tons in 1988, 20 tons higher than the previous year. Demand was expected to increase at the same rate in 1989.

In 1988, the demand volume for neodymium oxide and neodymium fluoride was approximately 400 tons. For 1989, demand was expected to reach 550 tons.

Hydrogen Absorption/Storage Alloys (Lanthanum, Misch Metal)

Approximately 20 years ago, it was discovered that LaNi₅ was capable of absorbing and storing hydrogen. Since the discovery, worldwide research efforts have been focussed on developing its potential for industrial applications.

Currently, the Ministry of International Trade and Industry is developing an energy-saving heat pump employing hydrogen absorption/storage alloy as part of the Ministry's Sunshine Project. In the course of the Project, large-scale industrial prototypes have been introduced. However, the current energy situation relatively being favourable in Japan, industrial use of the pumps has been limited.

Secondary Storage Batteries

Matsushita Electric Industrial Co., Ltd. announced that it would commence production and marketing of secondary batteries which employ electrodes of hydrogen storage/absorption alloy composition in late 1989. Compared with NiCd batteries on the market today, this new battery has the following advantages:

- 1.5 times the electric power output of a NiCd of the same size, or, from a different perspective, an equivalent power output is possible with a battery only 70 per cent the dimensions of a NiCd battery;
- reusable up to 500 times, with recharge possible in 1.5 hours; and
- rare earth is more advantageous in terms of resources than cadmium.

Matsushita Electric Industrial is using an alloy of the misch metal-nickel variety. Now at the mass production stage, the manufacturing cost is estimated to be the same as that for NiCd batteries.

Japan's annual demand for battery-use cadmium currently stands at 3 000 tons. Should hydrogen storage/absorption alloys be used in place of cadmium, the rare earth market would stand to benefit significantly.