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News Briefs

CHROMECORP RECOVERS FERROCHROME FROM SLAG

A new plant, commissioned at the end of 1992 at Chromecorp Technology's Rustenburg plant in South Africa, will recover about 20 kt/y of ferrochromium from slag. The unit is expected to achieve higher recovery rate, up to 95%, and a cleaner, directly saleable end–product than is usual with slag treatment operations. The process is characterized by two features: coarse FeCr is removed prior to any size reduction, thus maximizing the value of recovered alloy; and high product purity is couples with high recoveries in all size ranges, including – 1 mm fraction. High recovery and purity is achieved by using a combination of the patented magnetic technology and more conventional processes, such as jigging and spiralling. The use of combined magnetic and gravity separation methods allows barren slag to be rejected before complete size reduction, thereby reducing crushing costs.

MAGNEQUENCH OPERATION FOR SALE ?

General Motors Corp. is considering selling the Magnequench operations of its Delco Remy division., if a joint–venture partner cannot be found. Delco Remy's Magnequench unit, which makes powder metal permanent magnets and powders, has been looking for a partner since late 1992 to help run, and share the expenses in the highly specialized facility. GM built its Magnequench plant almost seven years ago at a cost of US$70 million. (*American Metal Market, April 22, 1993*).

CERN'S LHC MAGNETS

In the research and development programme for CERN's LHC high energy proton–proton collider to be built in the 27–kilometre LEP tunnel, a model twin–aperture superconducting magnet recently achieved a magnetic field of 10.25 Tesla after being cooled to 2 K. The magnet used new wide–cable niobium–titanium conductor, with up to 27 000 5 μm filaments. CERN LHC superconducting magnet development work involves collaborations with partners in Austria, France, Germany, Holland, Italy, Spain, Uk, Sweden and Finland.

PERMANENT MAGNETS MARKET SURVEY

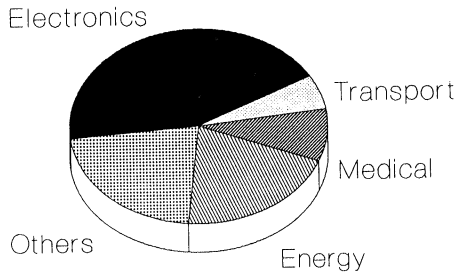
In October 1992, Business Communications Company (BCC) release a report entitled: *Permanent Magnets: Types, Processing, Applications, Intermaterial Competition and Markets.* BCC predicts a 1992 U.S. market for permanent magnets of US$455 million and a 1997 market of $763, reflecting a 10.9 percent

annual growth. Metallic magnets are forecast to grow at an annual rate of 10.6%; from $178 million in 1992 to $295 million in 1997. Within this segment of the market, the rare earth cobalt magnet market will likely decline while the Nd–Fe–B magnets will increase their market at a 17.5% annual growth rate.

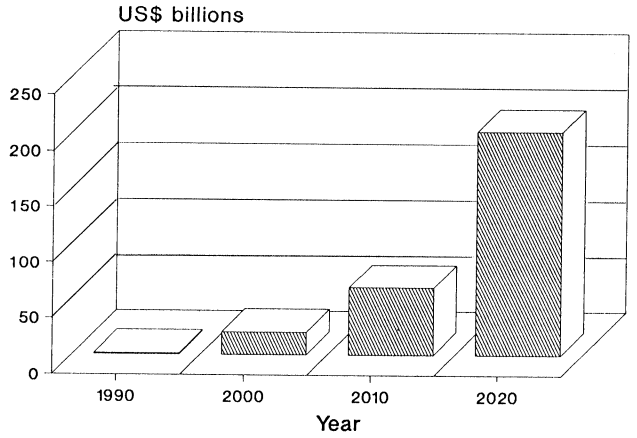
SUPERCONDUCTOR MARKET TO SOAR BY 2020?

Industrialists involved in superconductor research believe that, given sufficient government support for research and development, the market for superconductors could rise from its present level of US$1.5 billion to $150–200 billion by 2020 (*Nature, 20 May 1993, 197*). The present market consists entirely of products made from conventional low–temperature superconductors, in particular magnetic resonance imaging devices for medical use. But by 2020, products made with high–temperature superconductors are expected to comprise the dominant share.

Uses of Superconductors in 2020



Market for Superconductors



Source: Nature 363 (1993), 197

A NEW SUPERCONDUCTOR WITH THE RECORD T_c

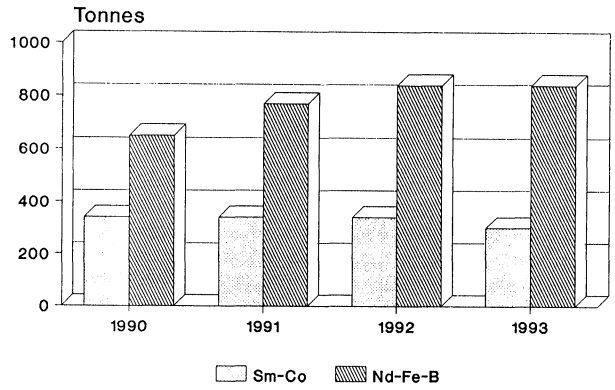
The recent discovery of superconductivity below a transition temperature T_c of 94 K in $HgBa_2Cu_{4+x}$ has extended the repertoire of high–T_c superconductors containing copper oxide planes embedded in suitably layered materials. It was suggested that even higher transition temperatures might be achieved in Hg–based compounds with more than one CuO_2 layer per unit cell. A. Schilling et al., ETH Zurich (*Nature 363* (*1993*), *56*) discovered superconductivity above 130 K in a material containing $HgBa_2Ca_2Cu_3O_{1+x}$, $HgBa_2CaCu_2O_{6+x}$. Both magnetic and resistivity measurements confirm a maximum transition temperature of ~ 133 K, distinctly higher than the previous established record value of 125 – 127 K observed in $Tl_2Ba_2Ca_2Cu_3O_{10}$.

Nd MAGNETS FROM DOWA MINING

Dowa Mining Co., Japan, has begun construction of a neodymium magnet plant based on technology originally developed by General Motors Corp. The plant will be capable of producing 10 tonnes of sintered Nd–Fe–B magnets a month. The fully automated plant, to be located on the premises of Dowa's Okayama Works is to be completed in March 1994 at a cost of US$22.7M. The main feature of Dowa's magnets is that they need no coating. They consist of crystalline particles each covered by a carbon–containing protective film. The initial sales goal is US$45M a year.

THE RARE EARTH MARKET STAGNATES

During 1992 the rare earth sector felt the effects of the economic recession in Japan and no improvement is forecast for 1993. The main potential area of growth lies in consumption of Nd oxide in magnets, although the trend towards the miniaturisation of magnets might lead a lower rate of growth in demand.



1993-estimate

Japanese demand for rare earths used in permanent magnets. (Source: *Roskill's Letter from Japan, February 1993*)