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News Briefs

JAMES E. LAWVER

James E. Lawver died on May 26, 1996 in Florida after long illness. Lawver was born and raised in Denver and graduated from the Colorado School of Mines in 1943 with a degree in mining engineering. He joined the research department of the International Minerals and Chemical Company in 1945 and worked on the processing of phosphate minerals. He returned to the Colorado School of Mines in 1953 to complete his studies in metallurgy. His main interest was magnetic and electrical separation. In 1962 was Lawver appointed professor of the School of Mines at the University of Minnesota and was involved in the development of processes for beneficiation of taconite. In 1975 he returned to IMC as technical manager of phosphate minerals operation. In 1985 he retired and continued to work as a consultant.

HOW TO REPULSE BIRDS

Nemoto Industry Co., Ltd. (Japan) developed a unique bird repulsing device for electrical power transmission lines. The device rotates with weak wind and generates varying magnetic fields that disturb birds.

A MAGNET PRODUCER IN SOUTH AFRICA

Deutsche Magnet Technik (DMT) invested about US$50M in 1996 in South Africa's first ferrite magnet factory in Isithebe, KwaZulu Natal. DMT is owned by emerging–market funds based in Germany. The factory started production in September 1996 and was expected to reach full capacity of 1000 tons of magnets a month in April 1997. At full production, DMT would be supplying about 2% of the world's $3 billion magnet market which is projected to grow to about $10 billion over the next 10 years. DMT has a technology and marketing agreement with Thyssen Magnet Technik, the German steel and electrical company, under which all the South African–made magnets will be sold internationally under the Thyssen name.

RECOVERY OF HEMATITE IN LKAB, MALMBERGET, SWEDEN

LKAB, Sweden, have completed pilot–scale tests with a newly proposed flowsheet for the treatment of hematite ore from Malmberget. The new flowsheet involves gravimetric separation, low–intensity magnetic separation (LIMS) and high–gradient magnetic separation (HGMS). In addition to the pre–concentration of coarse magnetite particles which were liberated from the ore, LIMS was also

used to recover fine magnetite prior to HGMS. Two wet carousel SALA HGMS separators (the carousel diameter of 2.5 m) were used. The capacity of HGMS was 127 t/hour. The feed into HGMS was 95% – 2 mm. In two–stage HGMS separation the grade was increased from 66% Fe to 69% Fe in the final magnetic concentrate. The magnetic approach was found to be more economical than flotation. Production using this new flowsheet will commence in 1998 to meet increasing demand from the pellet market.

RARE EARTH POWDER PLANT IN THAILAND

The Canadian– based company Advanced Material Resources (AMR) has announced plans to establish a $$m rare–earth powder facility in Thailand. The plant will produce value–added rare earth products that will be supplied to the permanent magnet market in the region–the major electronics and automotive manufacturers in Japan, South Korea and other South East Asian countries. It is expected that the wholly–owned subsidiary, Advanced Magnetic Materials (Thailand) Ltd. will be in operation by the end of 1997. The raw materials consumed at the new facility will come from AMR's two plants in China where Nd oxide is currently produced. AMR estimates that the world market for NdFeB magnets, growing by more than 20% annually, will be in the region of $5 billion in 2005.

SALA HGMS AT BRUNSWICK MINING AND SMELTING

A 2 tons/hour SALA HGMS pilot plant was operated at Brunswick (Canada) for a 9 month period. The tests demonstrated that HGMS could achieve separations comparable with flotation in terms removing galena from chalcopyrite, sphalerite and pyrite. It was unable to improve on flotation except in cases where pyrite and sphalerite activation was a known selectivity problem. Galena separated well from sphalerite, readily achieving concentrates exceeding 60% Pb at over 70% circuit recovery. Sphalerite recovery was consistently at 90% to magnetics. Pyrite was not split efficiently and tended to report with the mass split. Scale–up from laboratory to pilot scale was very good. Recovery of magnetics was independent of particle size down to 5 μm, below which recovery decreased significantly.
(*Proc. 28th Ann. Meeting Can. Min. Proc.*, Ottawa, *1996, 253–271*)

MASTER MAGNETS TO IRAN

Master Magnets (UK) recently won a £200 000 order for magnetic separation from Iran. The company has supplied a four–pole high–intensity high–gradient wet separator to a phosphate–processing operation. The machine is capable of separating Fe_2O_3 from 53 m^3/hour of phosphate slurry with density of 45% w/w. The contract also included the supply of a wet drum low–intensity magnetic separator to remove Fe_2O_3 from phosphate slurry with a maximum particle size of 0.3 mm at the rate of 96 m^3/hour.

Nd MAGNETS FOR DETECTION OF ANTIMATTER

Vacuumschmelze GmbH (Germany) has completed delivery of to ETH Zurich of 2.5 tonne permanent magnets made of VACODYM 510 HR. A dipole magnet 0.8 m in length and diameter of approximately 1.5 m is manufactured from about 5000 rectangular Nd–Fe–B magnets measuring 50x50x25 mm. The magnet forms the heart of a particle detector named Alpha Magnetic Spectrometer, a key device for a special space project jointly financed by the USA, Russia, Canada, Japan and Europe. The objective of the project is to prove the existence of antimatter.

CHINESE ND MAGNETS FOR SPACE PROJECT

Baotou Research Institute of Rare Earths (China) successfully completed a contract to deliver 400 kg of NdFeB permanent magnets to MIT. The magnets will be used in Alpha Magnetic Spectrometer designed for a space experiment project. The magnetic properties of the magnet, manufactured by one–way mold pressing technique are : B_r = 1.418 T, $(BH)_{max}$ = 49 MGOe. The Institute is planning to raise the energy product to 50 to 52 MGOe by employing the common isostatic pressing technique.

PERMANENT MAGNETS FOR ANTIPROTON RING

The Fermilab Main Injector and Tevatron projects made a major step forward wit the successful first operation of the permanent magnet 8 GeV line. The achievement marks the first large–scale use of permanent magnets for high–energy accelerators and helps establish permanent magnets as a cost–saving and effective accelerator technology. The magnets used are strontium ferrite and steel pole tips generate very precise magnetic field. The magnets will save approximately $100,000 in annual power costs.

EDWARD PURCELL 1912–1997

Edward Purcell of Harvard, who shared the 1952 Nobel Prize with Felix Bloch for work on nuclear magnetism, died in March. At the MIT wartime Radiation Laboratory he became Head of Fundamental Developments Group, working with a distinguished band on radar techniques. As researchers returned to basic physics, this new expertise led to precision measurements of magnetic fields and particle magnetism and led to important new spinoff discoveries. He also carried out pioneer work in radio astronomy and later turned to biophysics.