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News Briefs

MINERAL PROCESSING CONFERENCE IN SWEDEN 1995

A conference on mineral processing was held in Luleå, Sweden, February 14 to 16, 1995. The conference was organised by the Luleå University, Swedish Mineral Processing Foundation as well as Swedish Mineral Industry Research Organisation. Such a conference is held every year and contributions address practical and theoretical developments in minerals treatment, extractive metallurgy and waste recycling. Only one paper on magnetic separation was presented at the 1995 Conference, namely *Concentration of calcite* by Sunnebo Lars. The paper dealt with dry magnetic purification of calcite from Nordkalk Kalsium AB, Sweden. The product assayed less than 0.45% Fe while the feed contained more than 0.7% Fe.

CONFERENCE ON RARE–EARTH MAGNETS 1994

The University of Birmingham was the venue for the 13th International Workshop on Rare Earth Magnets and their Applications and 8th International Symposium on Magnetic Anisotropy and Coercivity in Rare Earth–Transition Metal Alloys held in September 1994. It was attended by 230 delegates from 25 countries and 150 papers and posters were presented, with more half of them on NdFeB magnets. Significant advances have been made in the production of high $(BH)_{max}$ magnets based on NdFeB and the new technique of rubber isostatic pressing was described. Advances were reported in the processing and characterisation of $Sm_2Fe_{17}N_3$ – type magnets, but the routine production of high $(BH)_{max}$ bonded magnets based on this material has not yet been achieved.

RECORD SUPERCONDUCTOR

Researchers at Los Alamos National Laboratory, USA have recently developed a flexible superconducting tape capable of carrying the electrical current of 1.3 MA/cm^2 at 77 K, 100 times higher than other similar superconducting tapes (C&EN **73**, 1995, 6). Previous tapes were created by using a thin film technique where $YBa_2Cu_3O_7$ (YBCO) is deposited on a single crystal substrate to a thickness of about 0.5 μm. Thin film superconductors have achieved 10 MA/cm^2, however, they are not suitable for many practical applications. The new superconductor tape is 1 to 2 μm thick and is deposited on a nickel alloy tape. A novel technique has been used by first depositing ZrO_2 on the metal tape. This buffer layer provides a suitable surface on which the YBCO crystals are deposited. The resulting tape is flexible enough to be wound into coils, so it could be used in superconducting motors, magnetic resonance imaging devices and other superconducting applications. So far tapes 5 cm in length and 1 cm wide have been produced and a process that would allow continuous lengths to be manufactures is being set up.

GM TO SELL MAGNEQUENCH

The U.S. –based rare earth permanent magnet producer Magnequench will be sold as a culmination of General Motor Corporation's three–year–old plan to restructure its parts and component business. The Magnequench operation will be sold to San Huan Group Inc. of Beijing, a group of Chinese investors. The Group will reportedly purchase Magnequench for US$56 million cash, a US$14 million note and a guarantee that San Huan will honour GM's 1993 national contract with the United Auto Workers union. Magnequench posted sales of $75 million in 1994 and employs about 400 workers. (*RIC News, June 1, 1995*).

MAGNETIC ATTACHMENT FOR FALSE TEETH

Hitachi Metals Ltd. has succeeded in producing a thin compact magnetic attachment for joining artificial teeth and gums. Nd–Fe–b permanent magnet is introduced to strengthen the adhesive strength by which the overall joining height has been reduced from the usual 2.5 to 3.1 cm to 2.3 mm. As a result, it is now possible to use the attachment at many places where it had been difficult to use, such as at the front of the mandible. The new attachment consists of a magnetic stainless steel keeper and a magnetic structural member with the rare earth magnet covered with the same magnetic stainless steel.

MAGNETIC TRAIN THAT DOES NOT LEVITATE

Sandia National Laboratories, USA have developed a concept for a high–speed magnetically powered train that does not levitate. It should be relatively inexpensive to build and can run on already–laid track. The Seraphim train, a spin–off of Star Wars technology, should be able to achieve 200 mph, against 300 mph for the maglev trains being built in Germany and Japan. The Seraphim, unlike a maglev train which has no engine aboard, would have a gas turbine that powers onboard electromagnets. The pulsed magnets induce reversed electric currents in a series of aluminium plates bolted to or near the track. The induced currents create their own magnetic fields that oppose those of the train. Optical sensors direct the fields to pulse on just as the magnets pass the midpoint of the aluminium plates, propelling the train forward by repulsion. Estimate is that construction of a Seraphim system would cost a quarter of what a maglev system would cost, and on a high–population line would have a 5–to–10–year payback. (*Inside R&D, July 19, 1995*).