

As is to be expected, the anomalous behaviour of the ionic sizes of the oxides disappears if we replace the hafnium ion by the ceric ion. This observation is not without interest in connection with the earlier, apparently insuperable, difficulty of deciding whether to place cerium in the third or in the fourth group of the Periodic Table. The cerium atom and the cerous ion are not directly related to zirconium, but the ceric ion is the pseudo-homologue of the zirconium ion. Similarly the quinquevalent praseodymium ion would be the pseudo-homologue of the niobium ion.

The investigation of a very large number of zirconium minerals and also of rock samples led to the

result that hafnium always accompanies zirconium in nature. Zirconium is chiefly found as zircon and in most cases the hafnium oxide content of zircon is 1.5 to 2.5 gm. hafnium oxide in 100 gm.  $ZrO_2 + HfO_2$ . From the above figures and also from analysis of the hafnium-zirconium ratio in meteoric stones, it follows that in the fluid-gaseous stage of our solar system a zirconium-hafnium ratio of about 60:1 prevailed throughout and, on account of their similarity, the same ratio is found in present lithosphere. About 1/200,000 part of the earth crust is built up of hafnium, the terrestrial abundance of the latter being as large as that of arsenic, molybdenum or tin.

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## ANNOUNCEMENT

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### COAL SCIENTISTS AWARD FOR 1981 - CENTRAL FUEL RESEARCH INSTITUTE DHANBAD

Ministry of Energy and Coal (Department of Coal) has instituted two annual awards for meritorious research in the fields of application oriented basic research or development research in Coal Science and Technology. The Awards will be of two categories, a "Senior Coal Scientist Award" open to all research, development and technological personnel connected with coal science and its utilisation and the other "Junior Scientist Award" restricted to similar personnel but below the age of 40 on first January of the year for which the Award is made.

Organisational aspects of the awards will be by Central Fuel Research Institute, Dhanbad. The awards will carry a cash prize of Rs. 5,000/- and Rs. 3,000/- respectively besides a Gold Medal.

Nominations are invited for Awards for the year 1981 on or before 31.5.82. Applications and rules and regulations regarding the awards are given by the above Institution.

Nominations for the awards can be made by Directors of IITs, CSIR National Laboratories and other Research Institutions, Deans of Science, Engineering and Technology, Deans of Faculties and

Head of Institutions of Universities, Learned and Professional Societies/Organisations. Managing Director/General Managers of Coal-based industry, N.R.D.C., N.P.C. etc. and all relevant organisations concerned with coal in any way could also recommend persons. Individuals can also apply for the Awards through the Heads of their organizations who should vouchsafe for the statements made by the applicants.

Each nominations (in 10 copies) should accompanied by a detailed statement of work and attainment of the nominee and a critical assessment in not more than 500 words bringing out the importance of the significant research and development contributions of the nominee made during 5 years preceding the year of the Award.

Nominations should be sent in sealed cover marked to the Director, Central Fuel Research Institute, P.O. FRI 828 108, Dist. Dhanbad (Bihar). The selected Awardees will be informed of the results directly, and also through various media of information.

Further details can be obtained from Samir Sen, Information and Liaison Officer, Central Fuel Research Institute, P.O. FRI Dist. Dhanbad, (Bihar).

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