

Seminar on "Recent trends in glass and glass-ceramics research"

FOREWORD

Glasses and glass-ceramics have received considerable attention in recent years because of the wide variety of properties exhibited by them. Also these materials provide challenging and complex problems to theoreticians. To discuss about the various aspects of glasses and glass-ceramics a one-day seminar on "Recent trends in glass and glass-ceramics research" was organized by the Ceramics and Glasses Group of the Materials Research Society of India at the Indian Association for the Cultivation of Science, Calcutta on January 28, 1994. This special section comprises some of the invited talks delivered by experts in this field.

A Mookerjee examines the theoretical problem of phase stability in random binary alloys after introducing the augmented-space recursion method coupled with the orbital peeling technique. He applies this powerful tool successfully to the alloy system $\text{Pd}_c \text{V}_{1-c}$.

C S Sunandana discusses the structural characteristics of ion-conducting tellurite glasses containing different species of alkali ions. He also delineates an unified theory of ion migration in glasses to explain the electrical conductivity variation as a function of alkali ion concentration as also the mixed alkali effect.

B K Chaudhuri reviews the different aspects of glass-ceramic route to preparation of high T_c superconductors. The conduction mechanism in the precursor glasses, the glass formation in different oxide systems, crystallization mechanisms, viscosity changes as a function of composition and its influence on fiberization characteristics are some of the topics covered by him.

D Ganguli introduces the basic steps involved in the preparation of glasses by sol-gel technique. He touches upon the basic issues involved in giving a proper definition of glass in the wake of tremendous advances made in synthesizing a gamut of materials by sol-gel process. He describes briefly the most recent developments in the preparation of new and exotic glasses with potential applications.

A Ghosh gives an account of his investigation on glass formation and structure of some transition metal ion glasses based on unconventional network formers viz. Bi_2O_3 and PbO .

U S Ghosh discusses the anomalies observed in the vibrational behaviour of glasses through the ultrasonic velocity and attenuation measurements in a wide temperature range. He reviews the theoretical models which provide an explanation for such properties.

Lastly, I thank all the authors for their kind cooperation and the referees for critically examining the manuscripts.

K J Rao
Editor

D Chakravorty
Guest Editor