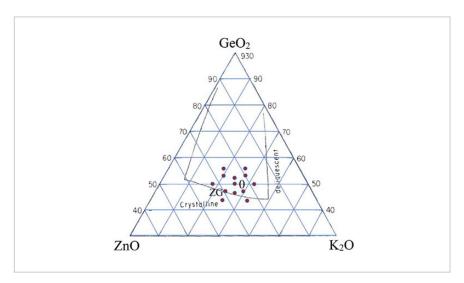
Germanosilicate Optical Glasses Comprising Zinc Oxide

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Germanosilicate glasses on phase diagram

Technology Summary

As a lower cost alternative to germania, germanosilicate glasses are well known for their high transparency in the visible and near-IR regions, making them desirable for fiber and planar waveguides, optical amplifiers, and solid-state lasers. Zinc oxide (ZnO) has drawn much attention in recent years due to its optical and electronic properties, such as UV-shielding and a wide direct band gap, in addition to being non-toxic and relatively low cost. Now, Penn State researchers have added ZnO into germanosilicate glasses for the first time to produce novel compositions with interesting properties. A variety of compositions have been prepared and their composition-property relationships characterized extensively, including measurements of density, refractive index, transmittance, cut-off edge, glass transition temperature, and thermal expansion coefficient.

Application & Market Utility

The ZnO-containing germanosilicate glasses have a refractive index value close to that of pure germania glasses (at a much lower cost) and significantly higher than that of soda lime silicate glasses, allowing for lower-curvature lenses. Owing to the presence of ZnO, the cut-off edge is significantly higher than that of soda lime silicate glass, which endows these glasses with UV-shielding properties. Finally, due to their high transparency and good glass-forming ability, these glasses have potential applications as optical components in a variety of systems.

Next Steps

Seeking research collaboration and licensing opportunities.

TECHNOLOGY READINESS LEVEL

1-3

Seeking

Investment | Licensing | Research

Keywords

- germanosilicate glass
- zinc oxide
- high refractive index
- glass forming ability
- UV cut-off edge

Researchers

John Mauro

Professor of Materials Science and Engineering Online Bio Website

Other Researchers

Ye Luo

Originating College

College of Earth and Mineral Sciences

Office of Technology Management Contact

Smith, Matthew mds126@psu.edu 814-863-1122

