Optimizing Oxynitride Glass: Exploration of Production Techniques and Properties

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Abstract

Historically, oxynitride glasses have faced challenges due to relatively high production costs, impurities, and non-transparency in the visible region. Likely contributing factors include the rapid decomposition of the nitrogen source (SiN) at high temperatures and the formation of metal silicide during the melting process. The replacement of SiN with AlN, along with the use of very pure starting materials, impacts the rate of decomposition and the formation of metallic silicide, significantly influencing the final glass quality. This presentation will provide an overview of oxynitride glasses in the Ca-(Al)-Si-O-N system, focusing on their preparation using different techniques, variations in properties with nitrogen and modifier cations contents, and issues associated with developing fully transparent glasses.

Keywords: Oxynitride glass, nitrogen rich glasses, high calcium content, microhardness, refractive index.

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