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Chair	Dr. İlkay Sökmen

Structural and Property Modifications in Soda-Lime Silicate Glass via Hydrothermal Treatment

Levent Karacasulu, Riccardo Meggiolaro, Gian D. Sorarù, Mattia Biesuz

Industrial Engineering, University of Trento, Italy

Biography

Dr. Levent Karacasulu
Postdoctoral Researcher, Industrial Engineering, University of Trento, Italy

Abstract

Glasses play a crucial role in modern technology thanks to their diverse optical and mechanical properties. Enhancing these properties remains a key focus for advancing both scientific understanding of the glasses and practical usability. In this study, hydrothermal treatments were applied to soda-lime silicate glass at different temperatures to investigate their potential in tailoring the glass's structure and properties. The surfaces of the glass were chemically, structurally, and thermally characterized by various techniques such as differential scanning calorimetry (DSC), positron annihilation spectroscopy (PALS), and spectroscopic analyses. The mechanical properties were also determined using nano-indentation, and the crack formation probability was evaluated. The results showed that soda-lime silicate glass treated in hydrothermal conditions led to notable modifications in the structure, which was vigorously associated with enhanced optical and mechanical properties.

