

Title: *Aerogel fabrication and applications*

Abstract

The lecture provides an in-depth introduction to aerogels, covering their fabrication methods and diverse applications. In the first part, we will explore key fabrication techniques, including sol-gel processing, drying methods (supercritical, ambient, and freeze-drying), and the impact of material composition on aerogel properties. The second part will focus on aerogel applications across industries, from thermal insulation and lightweight composites to biomedical, environmental, and energy-related uses. A special focus will be given to biopolymer-based aerogels. The lecture is designed for researchers, engineers, and students seeking a fundamental understanding of aerogels and their potential in advanced materials science.