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Current Understanding of the Properties and Formation of Glass Fibers

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Glass fibers play a crucial role in various modern technologies, including fiber lasers, fiber communications, fiber-reinforced composites, and thermal and acoustic insulation. However, there is still ample opportunity to optimize the production process and enhance the performance of glass fibers, contributing to a more sustainable society. In this presentation, I will discuss our current understanding of the structure-property relationship and the mechanisms involved in glass fiber formation. Furthermore, I will outline the challenges we face and provide insights into the development of high-performance glass fibers for environmentally friendly production and applications, aligned with our vision for a sustainable future. Specifically, I will focus on inorganic fibers, emphasizing their role in composite reinforcement and thermal insulation. Additionally, I will touch upon the quantification of glass fiber spinnability.