



Wolfson Department of Chemical Engineering Seminar

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Room 6

Design and application of aerogel-based catalysts, from inorganic, to metal oxides and carbides

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Among the key physical and chemical properties required from catalysts and catalysts' supports for fuel cell and water electrolyzers are high surface area and electronic conductivity. These have been limiting factors in the design of advanced materials for energy production and storage. In the past decade I have been focusing my research on designing advanced 3D materials' frameworks based on aerogels. During these years, we developed three main categories of aerogel-based materials for fuel cells and water electrolyzers: inorganic covalent frameworks, metal oxides, and ceramics. These have been used for catalyzing the oxygen reduction reaction in fuel cells, the oxygen evolution and hydrogen evolution reactions in water electrolyzers and hydrogen pumps, and as corrosion-resistant catalysts' supports in fuel cells. In this talk I will share our aerogels design criteria, synthesis and application of some of the state-of-the-art catalysts in their categories.