The use of waste biomass in the synthesis of platinum-free sustainable electrocatalysts

Fuel cells are clean and efficient energy devices. The most widely used electrocatalysts for the cathodic oxygen reduction reaction (ORR) in polymer electrolyte fuel cells (PEFC) make use of platinum to favor this sluggish reaction. In the last decades the use of transition metals on N-doped carbon have been proposed as alternative electrocatalysts. More specifically, the study of N-doped porous carbon materials derived from biomass has become a “hot-topic” because of their low cost, non-toxicity and renewability. Fe-N-C electrocatalysts displaying a promising performance as ORR electrocatalysts have been synthesized from a variety of biomass to valorize organic waste into valuable resources in the view of circular economy.

Purpose of this talk is to illustrate the most recent efforts to engineering Fe-N-C electrocatalysts for ORR from transition metals on N-doped carbon derived from waste biomass. The main characteristics, pros & cons and future outlines will be discussed in detail.

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