

Chemical Reactions with Contact Electrified Surfaces

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Abstract— Making use of static electricity developed on electrets as an energy source has long been a dream for scientists. However, in practice, even the highest surface charge densities that can be attained on these surfaces with contact electrification can only produce a small fraction of electrons that are needed for chemical reactions to occur. Nevertheless, here we present a few examples of many possible chemical reactions-nanoparticle synthesis, dye bleaching, rotaxane switching¹ and polymer synthesis-that can still be driven on contact electrified surfaces, yet with a different mechanism than a simple electron transfer can explain. Achieving chemical reactions with contact electrified surfaces is not only simple by comparison to the conventional way of chemical synthesis but also environmentally friendly since the polymers can be reused for many cycles without significant loss of efficiency.

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