Chemistry of Contact Charging and Contact Charging in Chemistry

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***Abstract*— It has recently been shown that the nontrivial problem of solving the mechanism of contact charging on polymeric dielectrics can be largely enlightened by the help of chemical methods. Above all, at the molecular level, contact charging involves breaking of bonds on surfaces, where chemistry takes over. Very recently, it was shown that the breakage of bonds on surfaces not only leads to material transfer between the two surfaces and to their electrification but also can lead to useful and versatile chemical reactions.**

There is a lot of energy in bond-breaking! Although the mechanism of chemical reactions that can be performed by contact-charged surfaces was shown to be more complicated than a mere electron transfer, many chemical reactions can indeed be driven by these surfaces - from very simple nanoparticle synthesis and dye bleaching to more elaborate rotaxane shuttling and polymer synthesis. This new mechanochemistry of polymers provides novel ways of performing environment-friendly reactions.