

Effects of plastic deformation on triboelectric charging

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Abstract—Previous work has shown that material strain can affect triboelectric charging, and even in some cases reverse the direction of charge transfer. Here we examine the effect of plastic deformation (i.e., permanent strain) in PTFE materials. Our results show that the deformed PTFE behaves differently in charging experiments from the unstrained samples. This behavior is expected to be applicable to other materials generally. The results imply that the charging behavior of real materials may never be predictable, because the state of deformation of the materials, including on the nanoscale, will never be fully known.