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**A triboelectric series for liquid-solid contacts** PABLO ILLING, Emory University, JOSHUA MNDEZ HARPER, University of Oregon, JUSTIN BURTON, Emory University — A triboelectric series is a list of materials ranked according to their tendency to charge negatively or positively upon contact. For two solids, this process is known as triboelectrification and has been known since antiquity and extensively studied. Although less well studied, liquids can also experience triboelectrification during flow through pipes or even through air. This charging has been observed in petroleum pipelines, where potentials can become large enough to produce electrical breakdown and explosions. Liquid-solid tribocharging may also operate on worlds with exotic liquids (such as Titan) and may influence sediment transport in these planetary environments. Here, we present a series of experiment showing how liquids such as water, alcohol, and various oils charge while flowing adjacent to a wide variety of materials. Our experiments consist of dripping the fluids through different tubes into an isolated Faraday cup and measuring the increasing charge. We find a large variation in behavior. For example, dripping only through air consistently produces negatively-charged drops, whereas dripping through a Teflon tube leads to positively-charged drops. A strong dependence on flow rate is also observed, as well as the cleaning preparation of the materials.

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