

# Humidity Effects on Triboelectrification of Insulating Materials

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***Abstract***—Triboelectrification is the natural phenomena of the transfer of an electrostatic charge between two materials upon contact. This concept is seemingly simple, yet has left many debating over the factors affecting it, and how this charge is transferred.

The goal of this experiment was to determine how environmental factors, such as humidity affect different materials and their triboelectric charge. The experimental system is a sealed incubator chamber to control for humidity, and air pressure. Inside the incubator is a downward coiled copper tube (1.5 mm in-diameter), that contains teflon tubing, and is connected to a tin-metal Faraday cup. A single 500-800 micron sized particle of soda-lime glass or polystyrene is dropped into the top end of the coiled tube and the particle is allowed to rolls downward through the tubing accumulating charge before being deposited into the tin metal Faraday cup. The charge was measured and recorded within a period of time as the particle discharges. Measurements taken at a constant low relative humidity are compared to those of higher humidity. This was done by exposing the particles and tubing to higher levels of humidity in a separate chamber and reintroducing the materials at varying wet and dry combinations. It is necessary to determine the humidity affect triboelectrification in insulated materials to better understand the possible benefit and hazards of this process.