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Contact resistance and lifetime of organic thin film transistors GVIDO BRATINA, ANDRAŽ PETROVIC, University of Nova Gorica — We have used ed electric charge transport measurements coupled to Kelvin force probe microscopy of pentacene organic thin film transistors (OTFT's) to monitor the evolution of contact resistance as a function of time of exposure to ambient air. Or results demonstrate that exposure of OTFTs to ambient air for extended periods of time, results in two competitive mechanisms that are responsible for observed variation in drain-current. Initially, relatively fast oxygen doping through electronegativity-related creation of holes increases the carrier concentration and therefore increases the drain current. Slower, and persistent mechanism of water diffusion in the pentacene layer induces dipole-charge carrier interactions through the creation of energetic disorder. This results in long-term irreversible reduction of drain current.

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