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Ultraviolet-Ozone cleaning process of organic surface contamination layers

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To understand the Ultraviolet(UV)-ozone cleaning process of organic surface contamination layers, adventitious hydrocarbon layers on Si, OTS self assembled organic thin films on Si, and $C_{60}-(CH_2)_{12}-S$ self assembled layers on Au were cleaned with pure ozone jet and a UV lamp in combination with in-situ XPS measurements. Ozone molecules could clean unsaturated hydrocarbon surface layers at room temperature. However, saturated hydrocarbon molecules adsorbed on surfaces did not react with ozone molecules but they could be cleaned with oxygen atoms generated by the dissociation of ozone molecules under UV radiation. For adventitious carbon contaminations on Si surfaces, only a fraction could be cleaned by ozone at room temperature but with UV-ozone jet, it could be completely cleaned.