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(54) **Title:** METHOD OF MAKING MoO_2 POWDERS, PRODUCTS MADE FROM MoO2 POWDERS, DEPOSITION OF MoO2 THIN FILMS, AND METHODS OF USING SUCH MATERIALS

(57) **Abstract:** The invention relates to high purity MoO_2 powder by reduction of ammonium molybdate or molybdenum trioxide using hydrogen as the reducing agent in a rotary or boat furnace. Consolidation of the powder by press/sintering, hot pressing, and/or HIP is used to make discs, slabs, or plates, which are used as sputtering targets. The MoO_2 disc, slab, or plate form is sputtered on a substrate using a suitable sputtering method or other physical means to provide a thin film having a desired film thickness. The thin films have properties such as electrical, optical, surface roughness, and uniformity comparable or superior to those of indium-tin oxide (ITO) and zinc-doped ITO in terms of transparency, conductivity, work function, uniformity, and surface roughness. The MoO_2 and MoO_2 containing thin films can be used in organic light-emitting diodes (OLED), liquid crystal display (LCD), plasma display panel (PDP), field emission display (FED), thin film solar cell, low resistivity ohmic contacts, and other electronic and semiconductor devices.