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STRUCTURAL AND ELECTRICAL ANALYSIS OF CU_2O LAYERS FOR SOLAR CELL APPLICATION

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Abstract: In this work the structural and electrical properties of the Cu_2O layer of a metal oxide solar cell were investigated. Cu_2O films were synthesized by reactive direct current magnetron sputtering on quartz substrates and characterized with scanning electron microscopy (SEM), atomic force microscopy (AFM) and Hall effect measurements. The grain size and surface roughness have important implications for the optical and electrical performance of the Cu_2O layer. The SEM analysis revealed an increase in grain size in the sample treated with rapid thermal annealing at 900 °C. AFM analysis shows that the high thermal annealing increases the surface roughness by a factor of 10. The electrical properties of the Cu_2O film are enhanced after annealing at 900 °C.