Stabilisation of Cu films in WO3/Ag/Cu:Al/WO3 structures through their doping by Al and Ag

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Résumé en anglais	Indium tin oxide (ITO) is the most common transparent conductive material used in industrial processes. It has many advantages, but also some disadvantages: Indium is scarce and ITO deposition techniques are aggressive for organic materials, making it difficult to use it as top electrode in organic devices. Moreover its ceramic structure limits its application in flexible devices. Among the possible new In free transparent conductive electrode, dielectric/metal/dielectric multilayer structures such as WO3/M/WO3 appear very promising. However, silver, which is the metal the more often used is expensive. Therefore it would be very profitable if copper, which is abundant on earth, could be substituted for silver. However the stability with time of the structure using Cu is questionable due to the high Cu diffusivity. In the present manuscript we improve significantly the lifetime of the structures using the alloy Cu:Al when a thin silver layer (2 nm) is introduced between the WO3 bottom layer and the Cu:Al. It is shown that the Cu atom mobility is significantly decreased by the presence of Al of the alloy and of Ag which appears to diffuse into the metal layer forming an eutectic with Cu.
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