Currently, Molybdenum represents the best rear contact used in thin film Solar Cells, based on chalcopyrites Cu(In,Ga)(S,Se)$_2$ or CZTS for instance. However, its high price increases the solar cell cost and comes against the generalization of the photovoltaic energy. In order to overcome this fact, it is proposed in this work to replace partially Molybdenum by Titanium Nitride (TiN) in CuInSe$_2$ Solar Cells. The TiN layers were deposited by radiofrequency magnetron sputtering with substrate temperature fixed at 25°C, 500°C or 700°C, for two RF powers (150W, 200W). It is found that the sample deposited at 700°C shows the optimal stoichiometry (Ti/N□=□0.95), with a good crystallinity, a texturation along the(h00) planes and an epitaxial growth confirmed by phi-scans. The introduction of TiN in the rear contact requires the deposition of a thin Titanium layer as a buffer layer to improve the adherence of the TiN film. After analyzing the TiN/Ti/MgO structure, it is found that the Ti intermediate layer doesn't affect the TiN crystalline orientation, the stoichiometry remains close to 1 (Ti/N□=□0.94) in addition with a homogenous morphological surface