Nickel oxide and Vanadium doped nickel oxide thin films were successfully deposited on glass and ITO substrates by using ultrasonic spray pyrolysis technique. In this study, two deposition temperatures were chosen and their influence on structural, morphological and optical properties were investigated. Doped and undoped films are polycrystalline and crystallized on a cubic structure with preferred growth along (2 0 0) direction as expected for a randomly oriented film and no phases due to vanadium were detected. The size of crystallites were calculated with software Jade by the refinement of planes and results are similar for all samples. The films showed a rough and nanoporous morphology that tends to densify with the increase on temperature. Compositional analysis confirm the presence of Vanadium (V) atoms in only one sample which suggested that are localized in a highly dispersed form into the NiO structure. Raman spectra of the films showed two characteristic bands on NiO films and a shifted position for doped films which indicates that vanadium atoms causes a structural change. The optical transmission of the films was slightly improved on doped films

**Keywords:** Electrochromic, Vanadium doped nickel oxide films, ultrasonic spray pyrolysis

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