The effect of thickness and operation temperature on Ga doped ZnO thin film NOx gas sensor

황현석[a], 여동훈, 김종희, 송준태[1], 김정호[2]
요업기술원, [1]성균관대학교, [2]Kyushu Institute of Technology

Abstract : In this work, Ga-doped ZnO (GZO) thin films for NOx gas sensor application were deposited on low temperature co-fired ceramics (LTCC) substrates, by RF magnetron sputtering method. The LTCC substrate is one of promising materials for this application since it has many advantages (e.g., low cost production, high manufacturing yields and easy realizing 3D structure etc.). The LTCC substrates with thickness of 400 ㎛ were fabricated by laminating 12 green tapes which consist of alumina and glass particle in an organic binder. The structural properties of the fabricated GZO thin films with different thickness are analyzed by X-ray diffraction method (XRD) and field emission scanning electron microscope (FESEM). The GZO gas sensors are tested by gas measurement system under varing operation temperature and show good performance to the NOx gas in sensitivity and response time.

Key Words : Ga-doped ZnO (GZO); gas sensor; NOx; low temperature co-fired ceramics (LTCC)