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Oxygen vacancies induced Spin polarized current in Co-doped ZnO by Andreev reflection technique KUNG-SHANG YANG, HSIUNG CHOU, WEN LING CHAN, BO-YU CHEN, Department of Physics, NSYSU, Kaohsiung 804, Taiwan, SHANG-FAN LEE COLLABORATION[1] — Dilute magnetic semiconductor (DMO) is a semiconducting system with spin-polarized carriers and magnetic properties. However, since most studies had been focused on existence of FM, the proportion of spin-polarized current (SPC) in DMO is far from being determined. We used Point-contact Andreev reflection measurements on various $Zn_{0.95}Co_{0.05}O$ thin films, with controlled oxygen vacancies by sputtering in various H_2 partial pressure with Ar atmosphere. We found that conductance versus voltage (G-V) spectra suppresses as oxygen vacancy concentration increases. It indicates oxygen vacancies play significant role in inducing the SPC. To understand the origin of spin polarized current at the interface of the superconducting tip/CZO system, we use modified Blonder–Tinkham–Klapwijk (MBTK) model in ballistic and diffusive regime to interpret GV curve. The extracted SPC value were up to 70% in ballistic regime and 65% in diffusive regime. The results suggest tiny routes have been formed by oxygen vacancies which are extended throughout the whole films. This result confirmed that MBTK model in ballistic regime is more suitable for our GV spectra and this explains the observation of such a high SPC

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