# Oxygen permeability of perovskite ceramics $La_{0.9}Sr_{0.1}(Ga_{1-x}M_x)_{0.8}Mg_{0.2}O_{3-y}$ with M=Fe, Ni

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Oxygen permeability of planar type perovskite ceramics was measured using the lab-scale permeation test set. The Arrhenius plots for the logarithm of oxygen permeability versus reciprocal temperature curves for two types of ceramic samples (La0.9Sr0.1(Ga1-xMx) 0.8Mg0.2O3-y were shown, one type of which was M=Fe and the other type was M=Ni. Also, the Arrhenius plot of the composite sample with x=0 in La0.2Sr1.8Ga(Fe1-xMgx)O5-x/2 was shown. For three types of the samples, the permeated oxygen was not detected until ~700℃. The Arrhenius plots showed that the highest JO2 values were obtained at the Fe-containing samples with x=0.3 and the composite sample with x=0.

The apparent activation energy for oxygen fluxes, Ea, could be explained as almost completely being determined by the oxygen diffusion. The lowest activation energy were measured at x=~0.3 in case of Fe, though Ea evidently decreased with increasing x at lower iron concentrations. This means that the oxygen diffusion activation energy follows the same concentration dependence as the activation energy for oxygen transport measured by the AC-current technique.