The oxygen stoichiometry of CeO$_2$ and Ce$_{0.82}$Gd$_{0.18}$O$_{1.91}$ is determined by a combination of cyclic voltammetry and coulometric titration. The electrochemical cell employed is an oxygen pumping cell, in which the oxide is subjected to different oxygen pressures corresponding to the potential imposed in the temperature range 800-1000 degrees C. With scan rates of 2 mV/s potential sweeps on CeO$_2$ are reversible. The change in entropy is determined by either subtraction of e.m.f. curves obtained by potential sweeps of different temperatures or by measuring the e.m.f. during a temperature scan. The latter method yields the most reliable results. Potential sweeps on Ce$_{0.8}$Ca$_{0.2}$O$_{1.8}$ suggest that calcium is expelled from the lattice.