The phase diagram of the ternary system Sr/Mo/O has been determined at a temperature of 1000°C. Powder samples of the ternary compounds SrMoO$_4$, Sr$_3$MoO$_6$, SrMoO$_3$, Sr$_2$MoO$_4$ and SrMo$_5$O$_8$ were prepared by solid state reactions. The thermochemical data of all ternary compounds were determined. A new compound, Sr$_3$Mo$_2$O$_7$, with a layered perovskite structure ($a = 3.967(1)$, $c = 20.588(5)$ Å, I4/mmm) was found. Rietveld analysis based on powder X-ray diffraction data confirms that the compound Sr$_2$MoO$_4$ has the K$_2$NiF$_4$ structure (I4/mmm) with $a = 3.9176(1)$, $c = 12.8545(4)$ Å.

* Sonderdruckanforderungen an Doz. Dr. W. Reichelt.