Ion conductivity relaxation and specific heat close to the first-order phase transition of $\gamma$-RbAg$_4$I$_5$ \(^1\) RUBEN A. VARGAS, Universidad del Valle, HERNANDO CORREA, Universidad del Quindio, DIEGO PEÑA LARA, Universidad del Valle, PHASE TRANSITION GROUP TEAM — We report on simultaneous measurements of specific heat at normal pressure and ac conductivity in single-crystalline $\gamma$-RbAg$_4$I$_5$ close to and below its $\gamma$-to-$\beta$ first order phase transition at 121 K. We found an accurate proportionality between the specific heat, $c_p$, and the temperature derivative of the product $n E_\sigma$, where $\beta = 1 - n$, is the Kohlrausch stretching exponent for the conductivity relaxation and $E_\sigma = d(\ln \sigma)/d(T^{-1})$ is the dc conductivity activation energy, which is non-Arrhenius. Thus, our results show that the dc conductivity activation energy $E_\sigma(T)$ includes, besides the true microscopic energy “barrier” for independent ionic motion, $(1-n) E_\sigma$ (according the coupling model), an additional contribution from the enthalpy of the mobile Ag-ions defects, $h$.

\(^1\)This project was supported by the national Science Foundation of Colombia under Grant no. 1106-06-17649.