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Mössbauer Study of $Eu_{14}MnSb_{11}$ and $Yb_{14}MnSb_{11}$ Zintl Compounds. DURGA KAFLE, Department of Physics, USU, Logan, UT 84322, DENNIS BROWN, Department of Physics, NIU,Dekalb IL 60115 — Antimony-121 Mössbauer effect measurements have been performed mainly on $Eu_{14}MnSb_{11}$ and $Yb_{14}MnSb_{11}$ zintl compounds, through the temperature range from 2 K to room temperature. The isomer shifts observed (-4.5mm/sec to –10.3 mm/sec and -7.7 mm/sec to –11.2 mm/sec, respectively) from the present study for both $Eu_{14}MnSb_{11}$ and $Yb_{14}MnSb_{11}$ zintl compounds are close to the values (-8.54mm/sec to –8.73mm/sec) obtained for InSb, the standard compound for antimony-121 Mössbauer effect measurements. Isomer shift distribution fits by using a Voigt-based Gaussian distribution profile show distinct peaks at the corresponding average isomer shift values obtained from Lorentzian four-site fits for $Eu_{14}MnSb_{11.}$ The study of the temperature dependence of line broadening as well as hyperfine magnetic field confirms the existence of long-range magnetic ordering of antimony-121 in $Eu_{14}MnSb_{11}$below 12 K which resulted in the transition temperature, T_C, of 12 K, whereas T_C found in $Yb_{14}MnSb_{11}$ is 45 K. The linear fit of the natural logarithm of area versus temperature using the Debye model for the high-temperature limit gives the values of 185 K and 196 K for the Debye temperature for $Eu_{14}MnSb_{11}$and $Yb_{14}MnSb_{11}$ zintl compounds, respectively.

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