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**Frustrated magnetism in the diamond-chain like compound $Ba_3Cu_3Sc_4O_{12}$**[1] A.V. MAHAJAN, Department of Physics, IIT Bombay, B. KOTESWARA RAO, Dept. of Physics, IIT Bombay, J. BOBROFF, Labo. de Physique des Solides, Orsay, France — The structure of $Ba_3Cu_3Sc_4O_{12}$, having chains of corner-shared square plaquettes, is reminiscent of the "diamond chain" compound $Cu_3(CO_3)_2(OH)_2$ which has shown novel magnetic properties. We report preparation of polycrystalline samples of $Ba_3Cu_3Sc_4O_{12}$ followed by temperature dependent magnetic susceptibility $\chi(T)$ and heat capacity $C_p(T)$ measurements in applied magnetic fields up to $H = 90$ kOe. At high-$T$, $\chi(T)$ is fitted by the Curie-Weiss law ($\chi(T)=C/(T-\theta_{CW})$) and is suggestive of ferromagnetic interactions ($\theta_{CW} \sim 70$ K). However, in low-fields, the $\chi(T)$ shows a sharp peak at $T_N \sim 16$ K and the variation at lower temperatures is indicative of antiferromagnetic ordering. Clear evidence of the transition at $T_N$ is also seen in heat capacity data. The sharp peak in $\chi(T)$ and $C_p(T)$ moves to lower temperatures with increasing $H$. The $T_N$ is found to be strongly lowered by an applied field and $T_N \sim 0$ for H $\sim 70$ kOe. Further work to understand the relative exchange couplings between various Cu atoms is currently in progress.

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