# Syntheses and Crystal Structures of $Sr_7H_{12}X_2$ ($X$ = Cl, Br)

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Dichroic, pink to blue single crystals of $Sr_7H_{12}Cl_2$ and $Sr_7H_{12}Br_2$ were obtained by reacting Sr with $SrX_2$ or $NaX$ and $NaNH_2$ or $NH_4X$ ($X$ = Cl, Br) as hydrogen sources in a Na melt at 900 °C for 12 h in silica-jacketed stainless-steel or Ta ampoules. The crystal structures of the new compounds were determined by means of single crystal X-ray diffraction. Both title compounds crystallize isotypically to $Ba_7Cl_2F_{12}$ in the hexagonal space group $P\bar{6}$ (no. 174) with the lattice parameters $a$ = 998.06(3), $c$ = 392.84(3) pm for $Sr_7H_{12}Cl_2$ and $a$ = 1004.62(3), $c$ = 399.68(3) pm for $Sr_7H_{12}Br_2$. The hydride positions taken from the difference Fourier map agree with those of the fluorides of the isotypic compound $Ba_7F_{12}Cl_{12}$. The validity of our structural results is corroborated by EUTAX calculations and the comparison to $SrH_2$, $SrX_2$ and $SrHX$.

*Key words:* Strontium, Bromide, Chloride, Hydride, Synthesis, Structure Elucidation, EUTAX Calculations