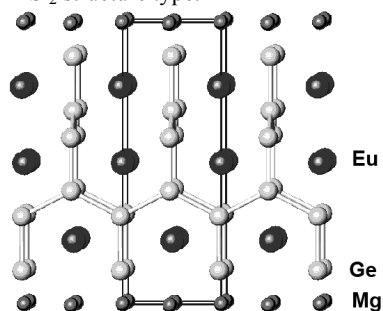


Synthesis and Crystal Structure of the New Zintl Phase $\text{Eu}_3\text{Mg}_2\text{Ge}_6$

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The new Zintl phase $\text{Eu}_3\text{Mg}_2\text{Ge}_6$ was prepared and structurally characterized. The compound crystallizes in the tetragonal space group $P-4m2$ (No. 115) with $a = 4.476(1)$ Å and $c = 12.794(3)$ Å. The structure contains the novel Zintl anion $^{10-}_4[\text{Ge}_6]$ with an infinitely branched chain of linked perpendicular zig-zag chains, related to sections of the $\alpha\text{-ThSi}_2$ structure type.



The occurrence of diffuse scattering in the $[0kl]$ -layer points to the presence of stacking faults. Different models for stacking faults were developed and discussed, favouring one possibility, which yields a good qualitative explanation of the diffuse scattering intensities [1] and also for the observed residual electron density.

[1] Proffen Th., Neder R.B., *J. Appl Cryst.*, 1997, **30**, 171.

Keywords: germanides, diffuse scattering, Zintl phase