Intermetallic Compounds

An intermetallic (also called an intermetallic compound, intermetallic alloy, ordered intermetallic alloy, and a long-range-ordered alloy) is a type of metallic alloy that forms an ordered solid-state compound between two or more metallic elements. Intermetallics are generally hard and brittle, with good high-temperature mechanical properties. Ref: Wikipedia

YbSi PdIn Mg_2Ge $PtAuSb_4$ PtPd $BaZn_2Ge_2$

$EuPd_2Si_2$ $PdIn_2Se_4$ NdAsSe $AgSbTe_2$ Ce_2SeTe

$KInS_2$ Re_2Te_5 Eu_3Sb_2 Eu_3P_2 Nd_3S_4

The prices on the products are available upon request and depend on various factors such as cost of the production, quality, dimensions, etc.

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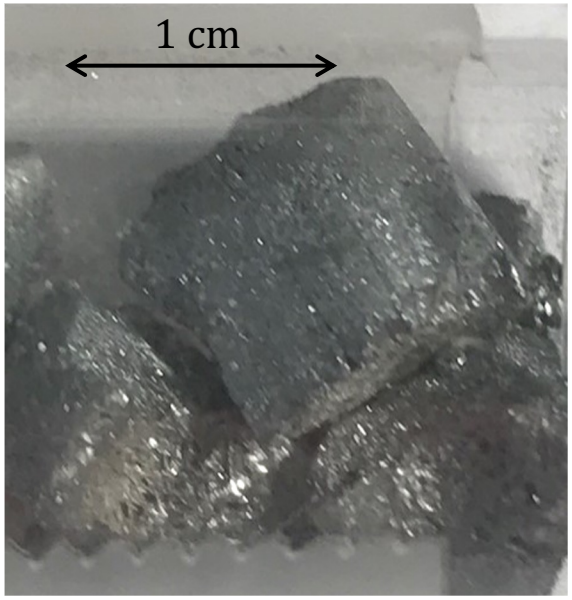
YbSi



Optical image of YbSi sample

YbSi belongs to the orthorhombic CrB-type structure with a space group *Cmcm*.

YbSi is the heavy-electron antiferro-magnet compound. It shows a second-order magnetic ordering transition of the Yb moments below 1.6 K.

InPd

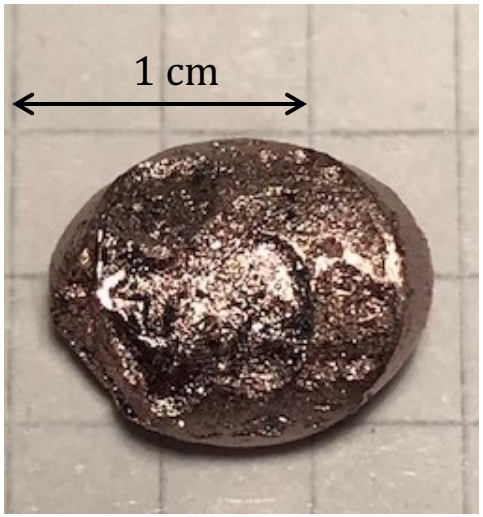
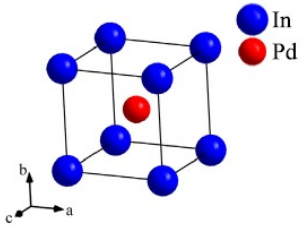


Image of InPd melted sample



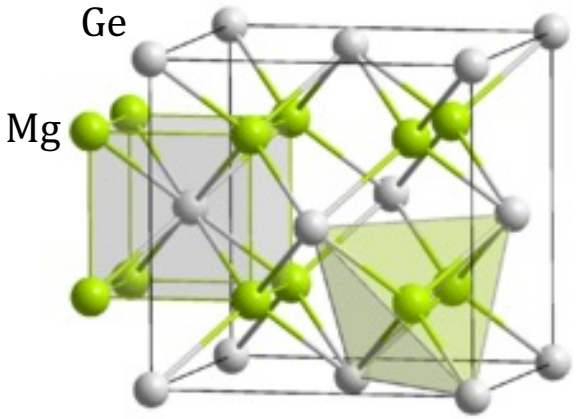
InPd

InPd crystallizes in a primitive cubic crystal structure of the CsCl (B2) type with a space group *Pm*-3*m* (No 221).

InPd is a predominant hole-type conductor.
Ref.: Intermetallics 55 (2014) 56-65

Mg_2Ge

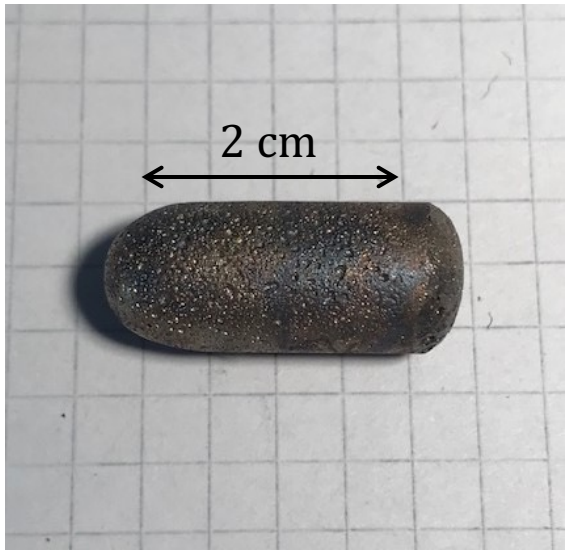
Optical image of Mg_2Ge crystals



Mg_2Ge crystallizes in the cubic structure with a space group *Fm*-3*m*

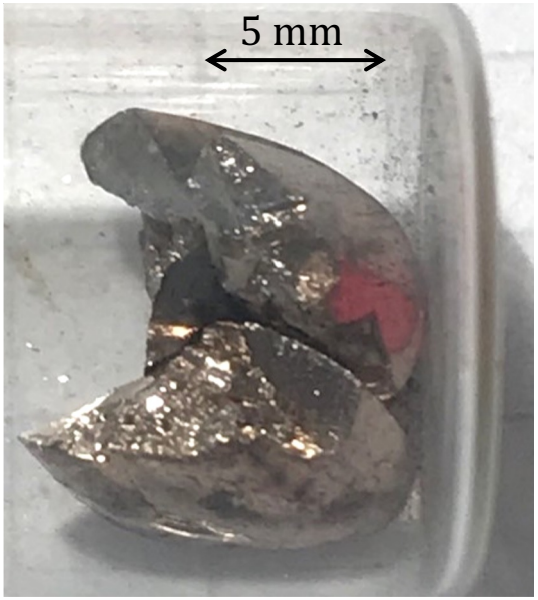
Mg_2Ge belongs to the class of Zintl phases with a relatively large electronegativity difference of elements. In the case of Mg_2Ge, four valence electrons are transferred from Mg to Ge. This leads to 4+4=8 valence electrons at the Ge atom.
Ref.: J. Alloy Comp. 235 (1996) 250.

$PtAuSb_4$



Optical image of $PtAuSb_4$ sample

PtPd

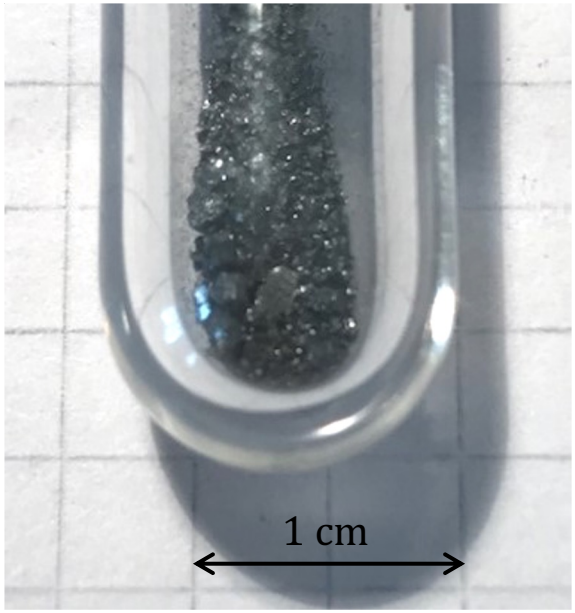


Optical image of PtPd alloy

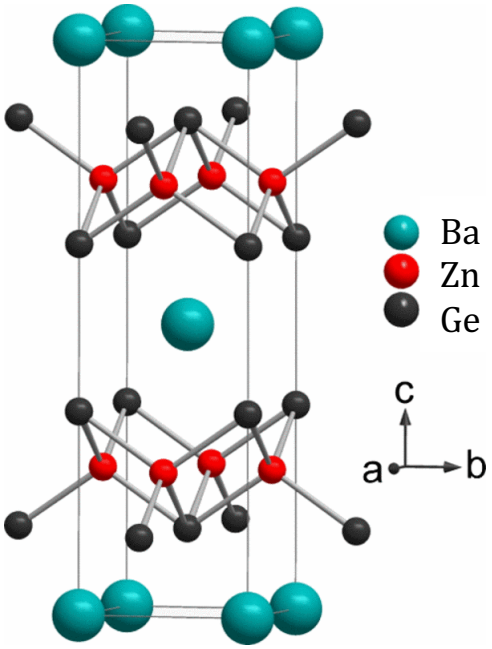
By employing first-principles calculations it was predicted the existence of type-II Weyl phonons in ZnSe, a well-known II-VI semiconductor.

Ref: Phys. Rev. B 103, 094306 (2021)

$BaZn_2Ge_2$



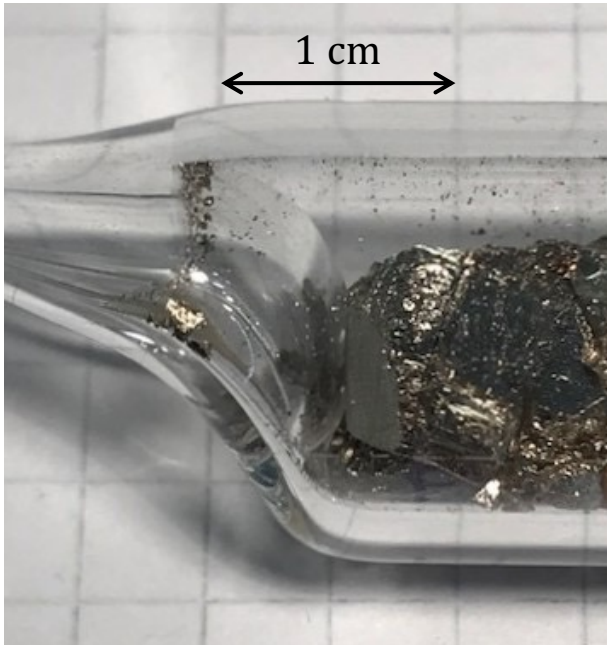
Optical image of $BaZn_2Ge_2$ sample



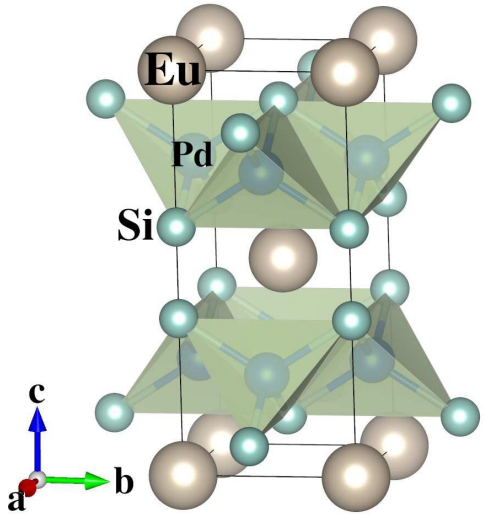
$BaZn_2Ge_2$ crystallizes in the $ThCr_2Si_2$ structure (tetragonal, *I*4/*mmm*; a = 5.53 Å, c = 10.55 Å, Z =2).

Ref.: Chem. Mater. 9 (1997) 1463-1466

$EuPd_2Si_2$



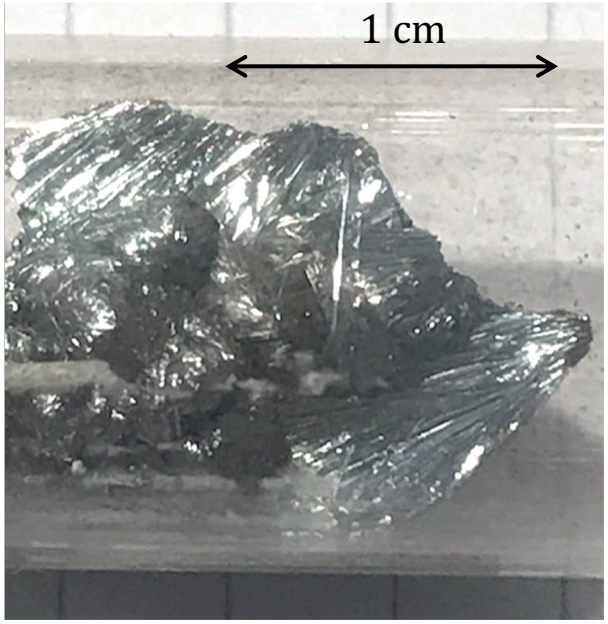
Single-crystalline ingot of $EuPd_2Si_2$



$EuPd_2Si_2$ crystallizes in a tetragonal body-centered $ThCr_2Si_2$-type structure with space group $I4/mmm$ (No. 139). It consists of layers $PdSi_4$ tetrahedra intercalated between Eu planes.

$EuPd_2Si_2$ is the mixed-valence compound that exhibits a valence transition from Eu^{2+} to Eu^{3+} around 160 K.

$PdIn_2Se_4$



Single-crystalline ingot of $PdIn_2Se_4$

$Ce_4(La_{0.76}Y_{0.24})_4B$

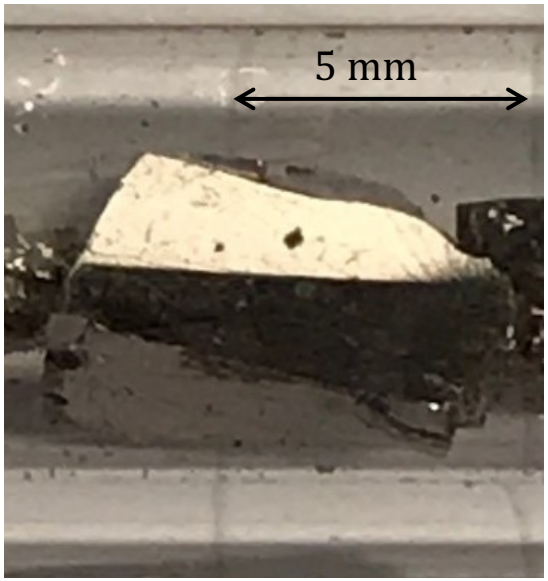
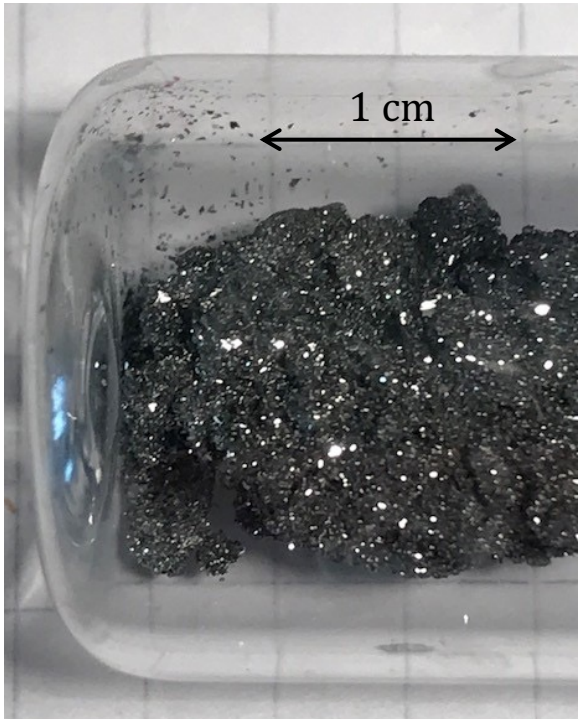


Image of $Ce_4(La_{0.76}Y_{0.24})_4B$ sample

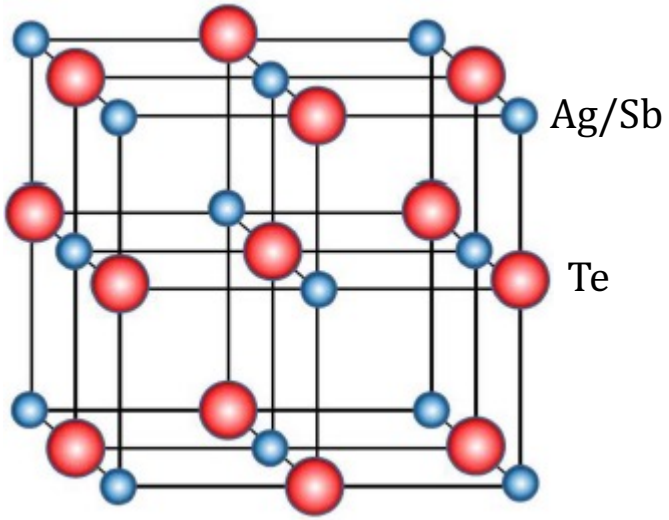
NdAsSe



Optical image of NdAsSe sample

NdAsSe crystallizes in the monoclinic CeAsS type structure.

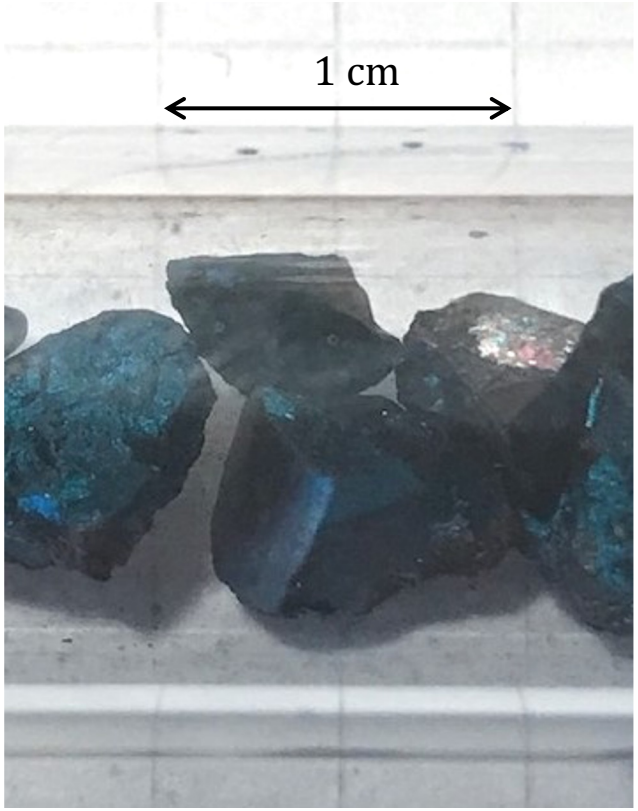
$AgSbTe_2$



$AgSbTe_2$ crystallizes in a NaCl–type structure (cubic, Fm-3m, 225), where Ag and Sb randomly occupying the Na site whereas Te is located at the Ce position.

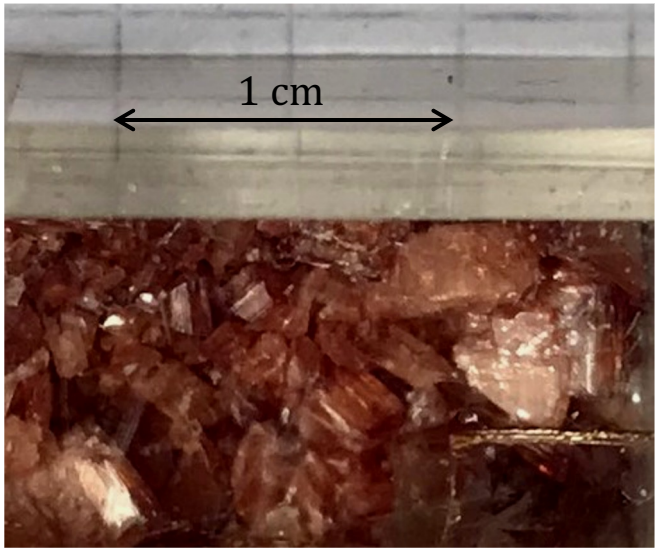
$AgSbTe_2$ is a promising thermoelectric material. The band gap is ~0.35 eV at room temperature.

Ce_2SeTe

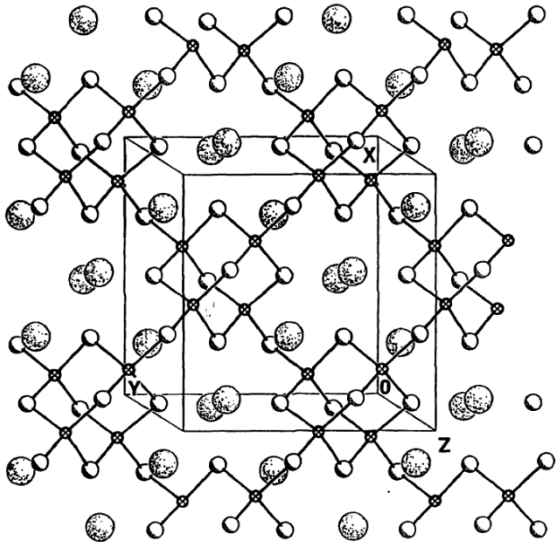


Optical image of Ce_2SeTe samples

$KInS_2$



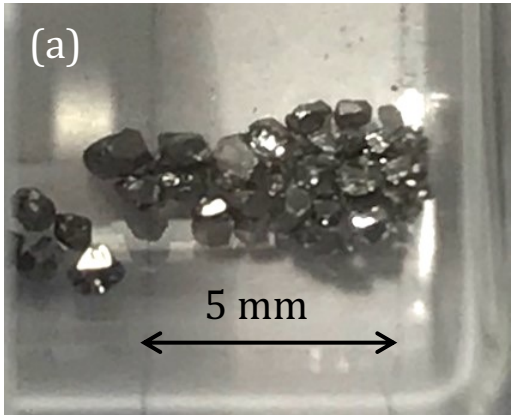
Optical image of $KInS_2$ samples

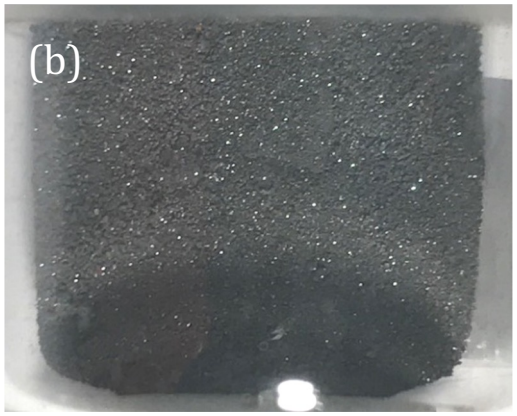


$KInS_2$ crystallizes in the monoclinic space group C2/c. The bonding is highly covalent and exhibits both 2D and 3D features.

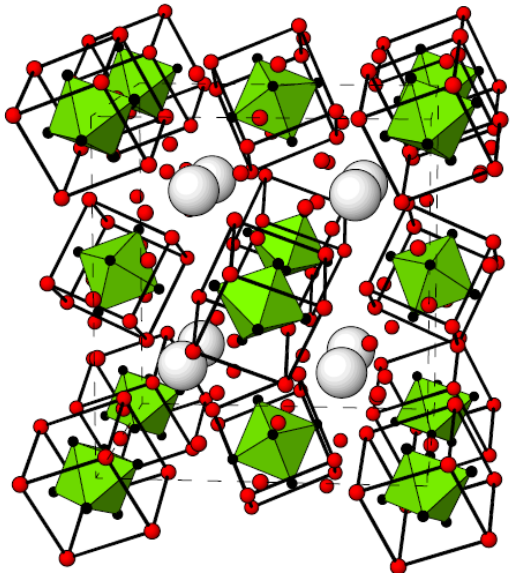
Limited information on the physical properties of $KInS_2$ is available.
It has a band-gap of 3.0 eV.
Ref.: J. Solid State Chem. 92, 2, 520-530 (1991)

Re_2Te_5





Images of Re_2Te_5 samples: (a) crystalline, (b) powder.



Re_2Te_5 crystallizes in the orthorhombic structure with space group *Pbca* (No 61). The Re cluster surrounded by Te atoms. The large spheres represent the atoms that can possibly be inserted in these voids.

Ref.: Proc. XVII Int. Conf. Thermoelec. Japan, May 24-29 (1998) 298

Re_2Te_5 is a semiconducting compound with an energy gap of ~0.8 eV.

Eu_3Sb_2

Optical image of Eu_3Sb_2 sample

Eu_3P_2

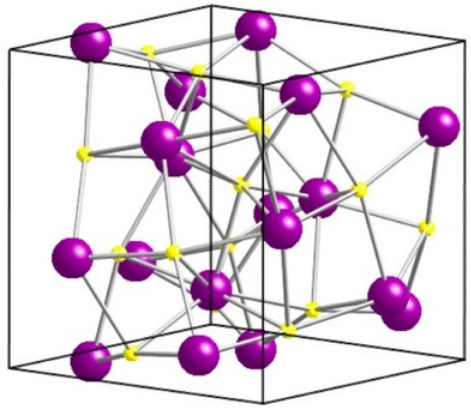
Optical image of Eu_3P_2 sample

Eu_3P_2 is ferromagnetic semiconductor with Curie temperature of 25 K.

^{151}Eu Mössbauer spectra of Eu_3P_2 reveal that the compound contains both Eu^{2+} and Eu^{3+} ions. Above 150 K thermally activated electron hopping between these ions is observed. Ref.: J. Phys. Chem. Solids 55, 2 (1994) 219-227

Nd_3S_4

Optical image of Nd_3S_4 sample



Nd_3S_4 adopts the cubic symmetry with space group I-43d (No. 220)

Among the many Nd-S compounds only Nd_3S_4 order ferromagnetically with T_c = 47 K.