**substance: $WSe_2$**
**property: crystal structure, physical properties**

**2H-$WSe_2$**

(S: structure (space group), CG: crystal growth (the numbers in parentheses correspond to $T_1$ and $T_2$, the temperatures (in °C) of the hot and cold end of the crystal growth tube, respectively), C: colour).

(The references in the last column refer to all data of this document)

**lattice parameters**

| | | | |
|---|---|---|---|
| $a$ | 3.282 Å | S: hexagonal, $D_{6h}^4$ – $P6_3/mmc$ | 62B, |
| $c$ | 12.937 Å | CG: (i) from polycrystalline mass, | 67F, |
| | | (ii) halogen transport (800/720) | 69W, |
| | | C: black | 72A, |

**resistivity, Seebeck coefficient, hole concentration**

| | | | | |
|---|---|---|---|---|
| $\rho_\perp$ | 0.167 Ω cm | p-type, | $\sigma_\perp/\sigma_\parallel \approx 200$ ($\rho_\perp$ = 1.3 Ω cm [70W]) | 72B, |
| $S_\parallel$ | 990 μV $K^{-1}$ | synthetic | | 72D, |
| $p$ | $2.35 \cdot 10^{17}$ $cm^{-3}$ | single crystal | | 77E, 78E, |

**energy gap**

| | | | |
|---|---|---|---|
| $E_g$ | 1.78 eV | optical gap | 79A |
| | 1.73 eV | direct gap, calculated | |
| $E_{g,th}$ | 0.17 eV | $T$ < 300 K | |
| | 1.33 eV | $T$ > 890 K | |

**effective hole mass**

| | | |
|---|---|---|
| $m_p$ | 0.01 $m_0$ | optical effective hole mass |

**Hall mobility, Hall coefficient**

| | | |
|---|---|---|
| $\mu_{H\perp}$ | 100 $cm^2/V\,s$ | n-type |
| $R_{H\perp}$ | – 80 $cm^3/C$ | |

**electron concentration**

| | |
|---|---|
| $n$ | $1.25 \cdot 10^{16}$ $cm^{-3}$ |

**Figures to this document:**

**band structure**: Fig. 1

**Brillouin zone**: Fig. 2

**carrier concentration**: Fig. 3

**electrical conductivity**: Fig. 4

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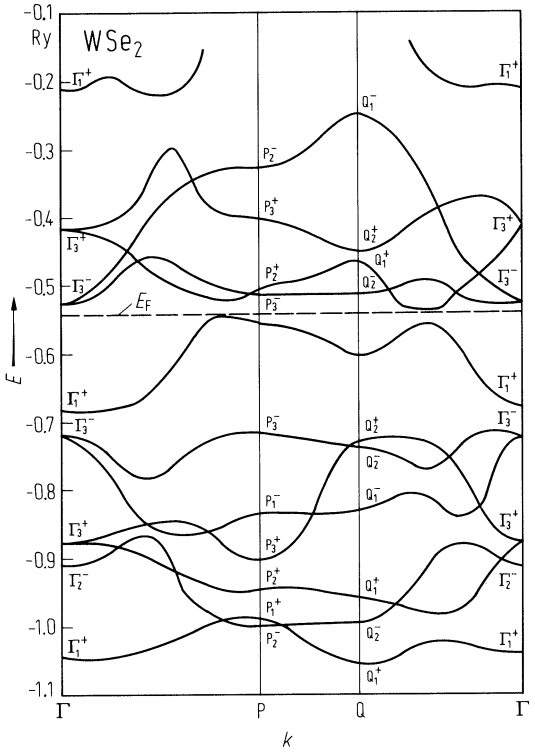
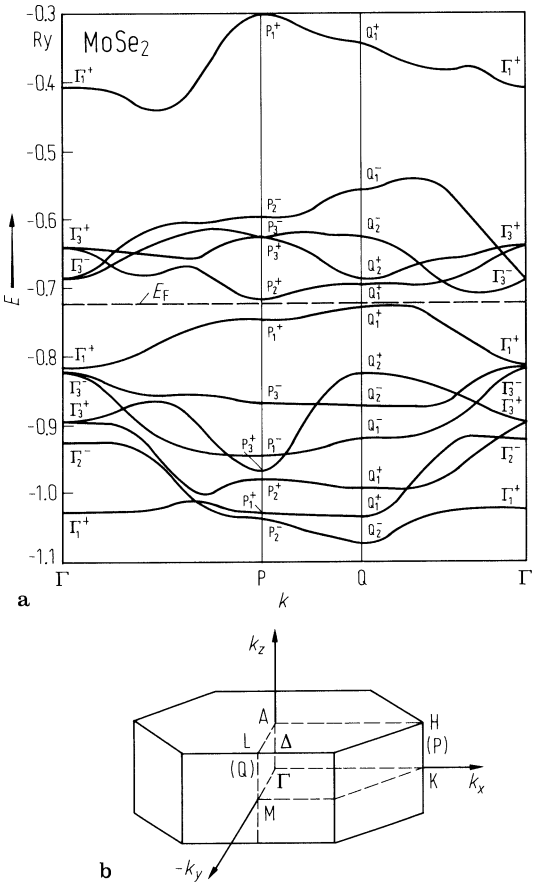
**Fig. 1.**

$WSe_2$. Band structure for 2H-modificaion [72B]; See Fig. 2 for Brillouin zone and for the meaning of P and Q.



## Fig. 2.

$MoSe_2$. (a) Band structure and (b) Brillouin zone for 2H-$MoSe_2$ [72B]. Q and P are the middle of each edge and the vertex of the hexagon in the two-dimensional approximation used for the calculations.



## Fig. 3.

$MoS_2$, $MoSe_2$, $WSe_2$. Carrier concentration (in $cm^{-3}$) vs. reciprocal temperature for (a) three different single crystal samples of n-type 2H–$MoS_2$, (b) three different single crystal samples of n-type 2H– $MoSe_2$, (c) three different single crystal samples of p-type 2H–$WSe_2$. A line of representative slope is shown. Unless otherwise marked, the experimental errors are within the symbol representing each measurement [77E].

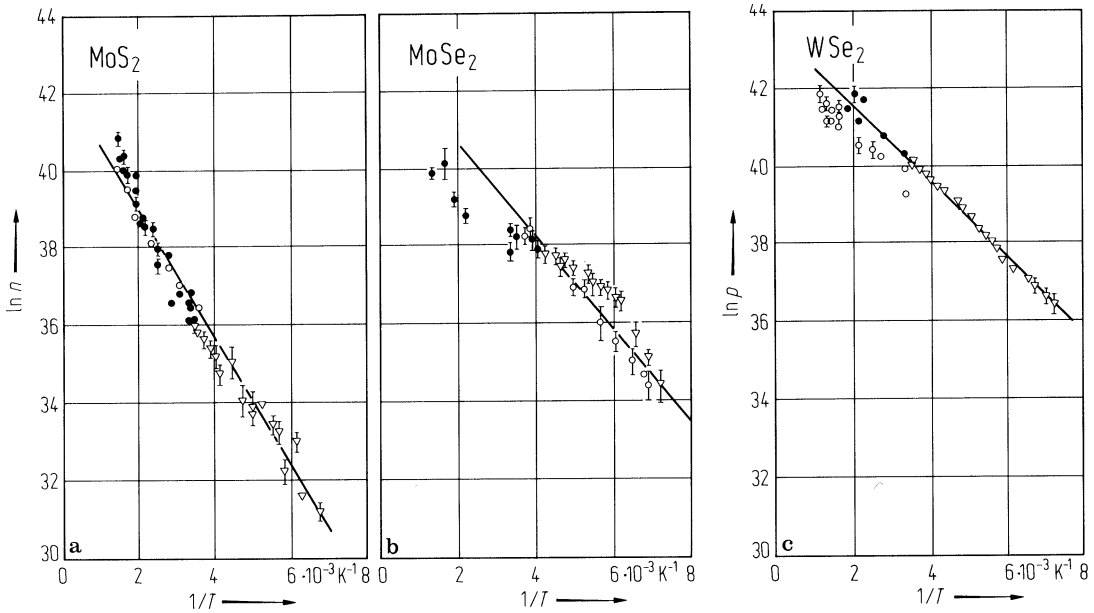


**Fig. 4.**

$WSe_2$. Electrical conductivity vs. pressure at room temperature for 2H-modification [75F]. $\sigma$ in $\Omega^{-1}$ $cm^{-1}$.