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X-ray investigations have shown a complete miscibility in the systems TaS_2/MoS_2 and $TaSe_2/MoSe_2$. In these systems mixed crystals could be obtained by chemical vapour transport with iodine as transport agent in the temperature gradient 1000 → 800 °C. By contrast, no mixed crystals are formed in the systems TiS_2/MoS_2 and $TiSe_2/MoSe_2$. The transport behaviour in these systems is reported.

Key words: Chemical Vapour Transport (CVT), Mixed Crystals of $Ta_{1-x}Mo_xS_2$, $Ta_{1-x}Mo_xSe_2$