

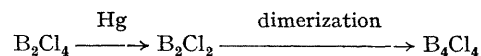
An Improved Synthesis of Tetraboron Tetrachloride, B₄Cl₄

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Summary An improved synthesis of tetraboron tetrachloride by passing diboron tetrachloride through a mercury discharge cell is described.

tetrachloride results from small amounts of B₂Cl₄ passing adventitiously through the discharge. A more obvious precursor of tetraboron tetrachloride is the diradical B₂Cl₂:



TETRABORON TETRACHLORIDE occurs to the extent of 1 or 2 mg/day as a by-product in the discharge preparation of B₂Cl₄.^{1,2} We have found that tetraboron tetrachloride can be made at the rate of about 10 mg/hr. by passing diboron tetrachloride through a mercury discharge cell of the type described in ref. 2. This represents a convenient two-stage synthesis from boron trichloride; the required B₂Cl₄ is prepared in the discharge apparatus and next day, after purification from boron trichloride, it is passed through the same discharge to yield B₄Cl₄ and considerable amounts of a yellow, involatile polymer. It seems probable that the B₄Cl₄ which is formed during the preparation of diboron

rather than BCl which appears to be the intermediate in the formation of B₂Cl₄ from boron trichloride.³

Tetraboron tetrachloride melts at 95° (vacuum-sealed tube) and only shows signs of thermal degradation at temperatures in the region of 200°. Although other subchlorides of the general formula (BCl)_n, *n* = 8–12, are formed^{3,4} during the decomposition of diboron tetrachloride we have been unable to isolate B₄Cl₄ from this source.

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