

9. Titanium is a metal which is expensive to extract and purify.

It can be extracted from an ore in a two-step process called the Kroll process.

- (a) The first step involves heating the ore with chlorine and carbon to convert titanium dioxide, TiO_2 , to titanium chloride, TiCl_4 .



The largest reactors can process 1600 kg of titanium dioxide per day.

- (i) Calculate the mass of chlorine, in kg, required to react with 1600 kg of titanium dioxide, TiO_2 .

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- (ii) Titanium chloride is a liquid at room temperature.

Suggest the type of **bonding and structure** present in titanium chloride.

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MARKS	DO NOT WRITE IN THIS
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