Mikume

TITANIUM EXTRACTION ASSIGNMENT 1 1. TiO2+Cl2-----------------TiCl4+O2 2. Why is an atmosphere of argon used for this reaction ? The titanium (iv) chloride is added to a reactor in which very pure sodium has been heated to about 5500c -everything being under an innert argon atmosphere. During this reaction the temperature increases to about 10000 c . The reaction is carried out in an argon atmosphere to prevent magnessium and sodium from reacting with oxygen in the air. 3. Another gas used instead of argon. ny of the elements in group O of the periodic table including helium , neon, krypton, xenon, and radon which are monoatomic and with limited excemptions chemically innert. 4. Why titanium is an expensive metal Titanium is very expensive because it is akward to extract from ore -for example rutile, TiO2 . You cannot use carbon reduction Titanium can not be extracted by reducing the ore using carbon as a cheap reducing agent. The problem is that titanium forms a carbide TiC, if it is heated with carbon, so you dont get the pure metal that you need. The presence of the carbide makes the metal very brittle.

That means that you have to use an alternative reducing agent. In the case of titanium, the reducing agent is either sodium or magnessium. Both of these would ofcoarse first have to be extracted from their ores by expensive processes. 5. The atom economy of the process used to extract titanium. Total mass of reactants = 212g Total mass of desired product= 22g Atom economy= mass of desired product *100% total mass of reactants 22*100 = 10. 774 212 The total economy of the Kroll process is 10. 3774 . 6. The atom economy will be lower since it was carried out in an ideal situationwhere all factors are constant and there is no external interference but in real situation

extal forces like heat loss, temparature, impurities will affect the system hence a lower value