

Chemical Engineering Department

Material and Energy Balances; Minor 1 29/8/2016, 4-5 PM

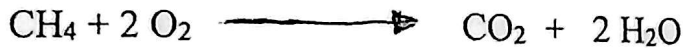
Time: 1 Hour

M. Marks: 20

1. Sodium hydroxide is produced from common salt by electrolysis. The essential elements of the system are shown in figure.

- a. What is the percent conversion of salt to sodium hydroxide *30%*
- b. How much water must be evaporated in the evaporator per kg of product. *0.29/1000 kg*
- c. How much chlorine gas is produced per kg of product. *0.29/1000 kg (5,4,3)*

2. Methane burns in the reactions



One hundred mol / h of methane is fed to a reactor

- a. What is the theoretical oxygen flow rate if complete combustion occurs in the reactor.
- b. What is the theoretical oxygen flow rate assuming that only 70 % of the methane reacts.
- c. If 100 % excess air is supplied, what is the flow rate of air entering the reactor. (3,2,3)

