Chemistry 201

Haber process

NC State University

The Haber Process

The (unbalanced) Haber process is

$$N_2 + H_2 = NH_3$$

Given that N_2 can be taken from the atmosphere (and N_2 gas is 79% of the atmosphere), determine What partial pressure of H_2 is required to match this partial pressure (i.e. so that N_2 is no longer the limiting reagent).

The Haber Process

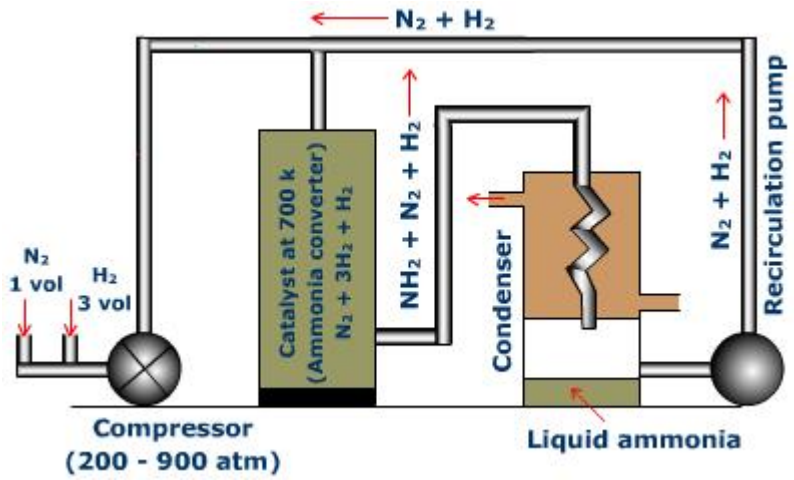
The Haber process is the industrial process of ammonia production from gaseous nitrogen and hydrogen. Given that N_2 can be taken from the atmosphere (and N_2 gas is 79% of the atmosphere), determine what partial pressure of H_2 is required to match this partial pressure (i.e. so that H_2 is not the limiting reagent).

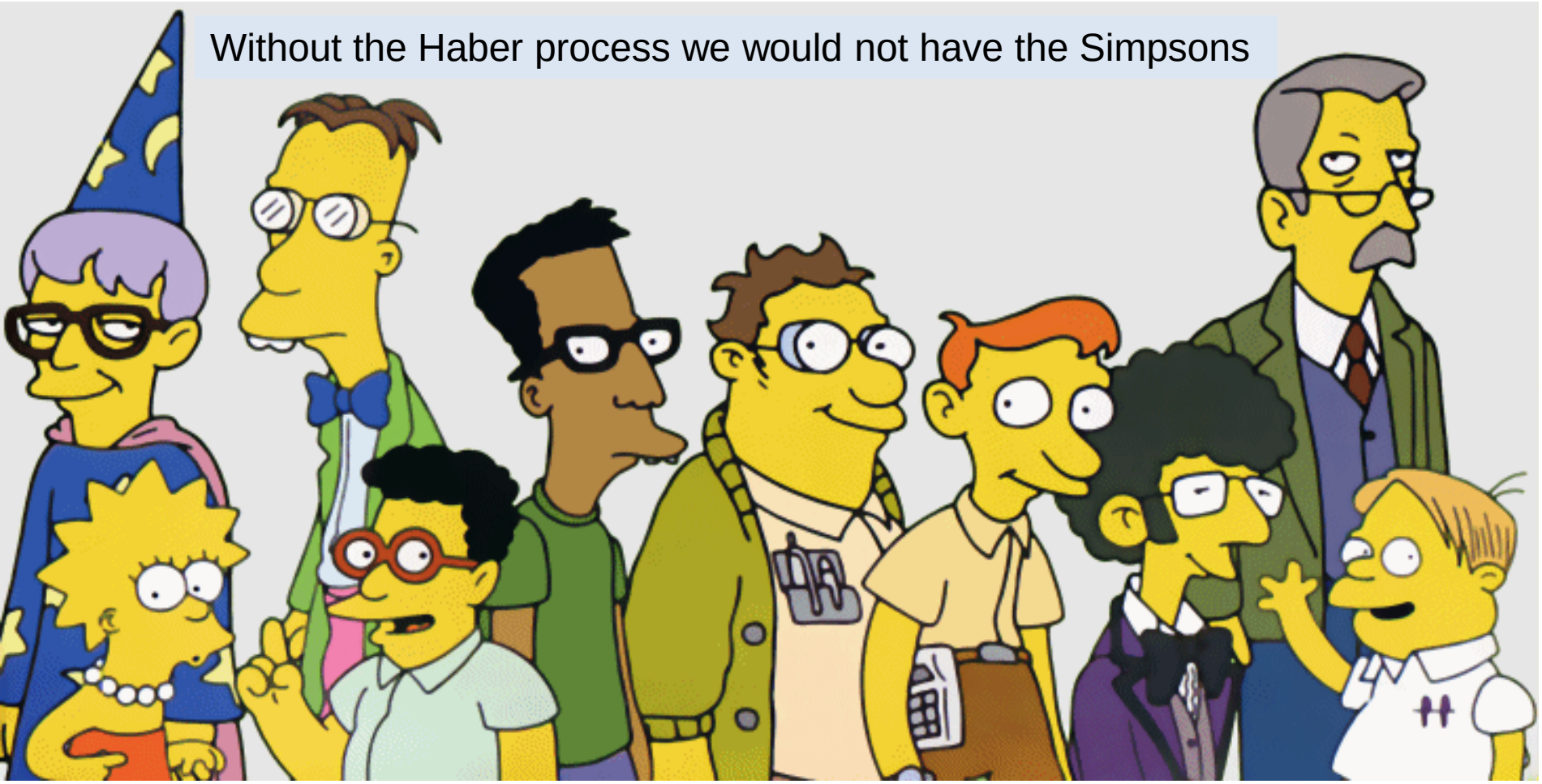
Solution: the balanced equation is

$$N_2 + 3\ H_2 = 2\ NH_3$$

The pressure of N_2 is 0.79 atm. To satisfy the mole ratio we need 3 times this pressure of H_2. Thus, $P_{H2} = 2.37$ atm.

The Haber process permits agriculture to support a population of nearly 7 billion




Without the Haber process we would not have the Simpsons