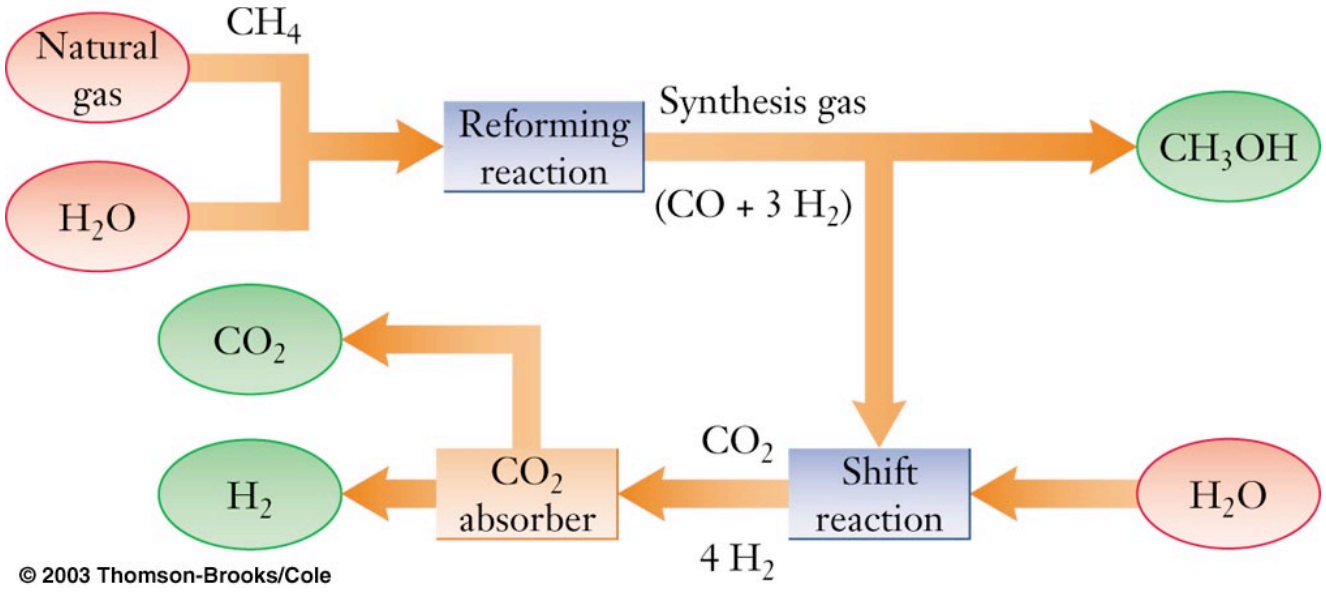
The principle industrial source of hydrogen gas is from natural gas and water via a two step process:

1. Reforming Reaction: **$CH_4(g) + H_2O(g)$ <------> $CO(g) + 3\ H_2(g)$**
2. Shift reactions: **$CO(g) + H_2O(g)$ <------> $CO_2(g) + H_2(g)$**



The equilibrium constant, K_p for the first reaction is 1.8×10^{-7} at 600 K. Suppose 1.40 atm of $CH_4(g)$ and 2.30 atm of $H_2O(g)$ are placed in a reaction chamber. What will the equilibrium partial pressure of $H_2(g)$ be at equilibrium after the first reaction ?

See Chapter 19, pp 675-6 for more information about this process