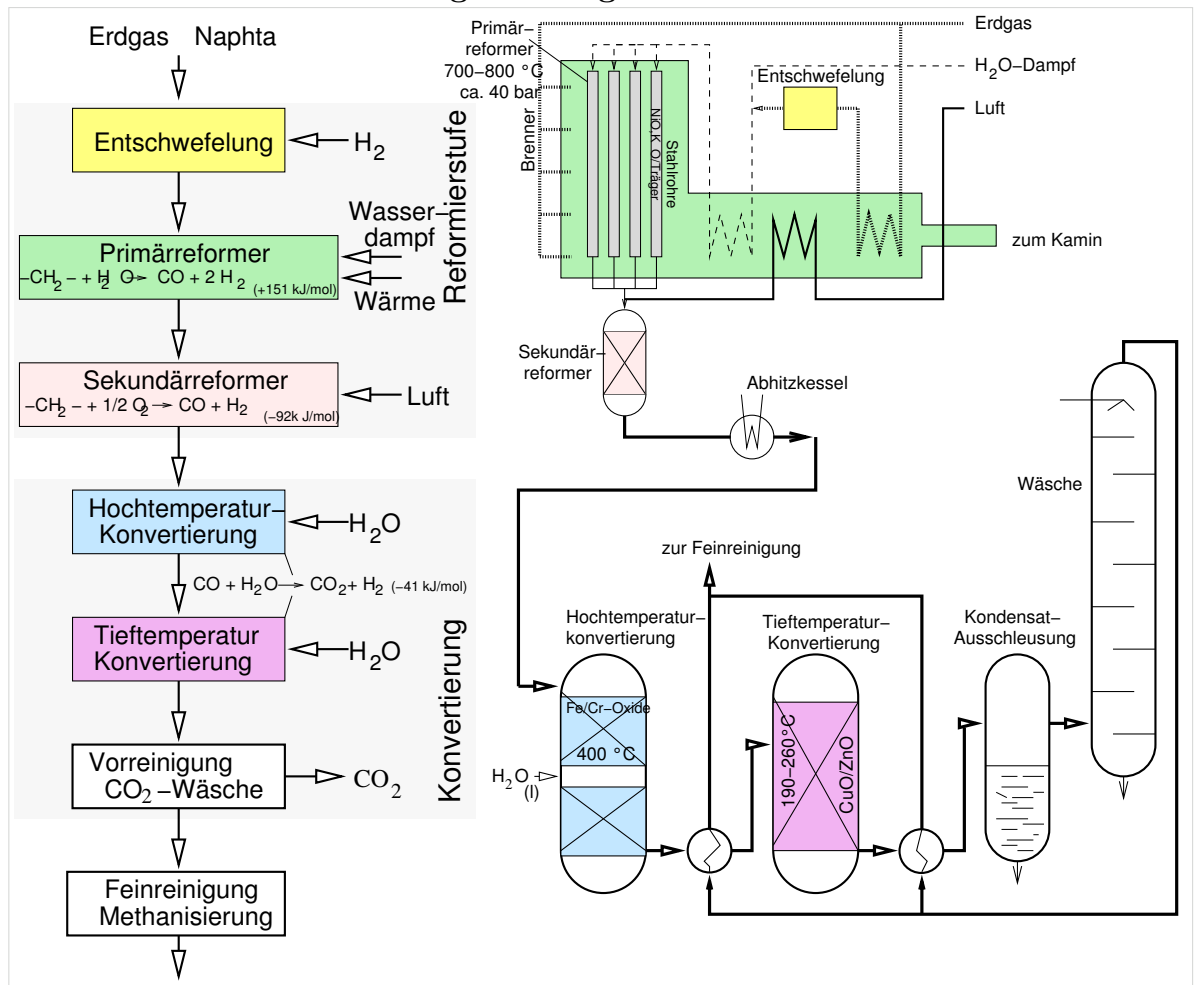


2.2. Ammoniak-Synthese (Haber-Bosch-Verfahren)

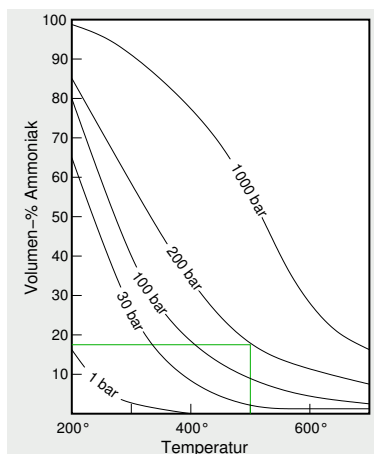
2.2.1. Allgemeines

2.2.2. Rohstoffe: Wasserstoffgewinnung



Steam-Reforming zur Wasserstoffgewinnung aus Naphtha

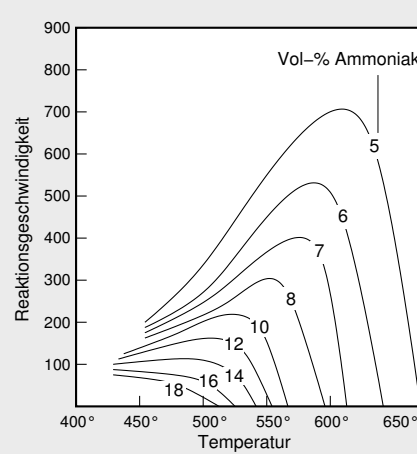
2.2.3. Physikalisch-chemische Grundlagen der Ammoniak-Synthese



Thermodynamik

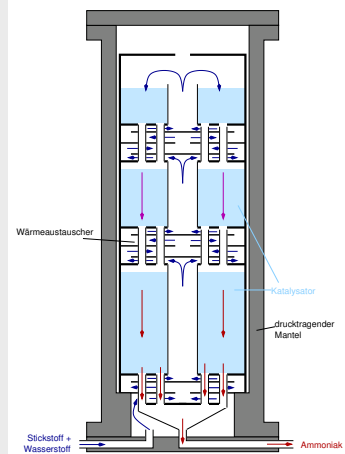
$$y_{\text{NH}_3} = 1 + a\sqrt{a^2 + 2a}$$

mit: $a = \frac{8}{\sqrt{27}} \frac{1}{K_{\text{P}}}$



Kinetik ((Tempkin-Pizhev-Gl.)

$$r_{\text{NH}_3} = k_{\text{B}} p_{\text{NH}_3}^{-1} p_{\text{H}_2}^{3/2} p_{\text{N}_2}^2 \left(1 - \frac{1}{K_{\text{PNH}_3}^2} p_{\text{NH}_3}^2 p_{\text{H}_2}^{-3} p_{\text{N}_2}^{-1}\right)$$



Vollreaktor