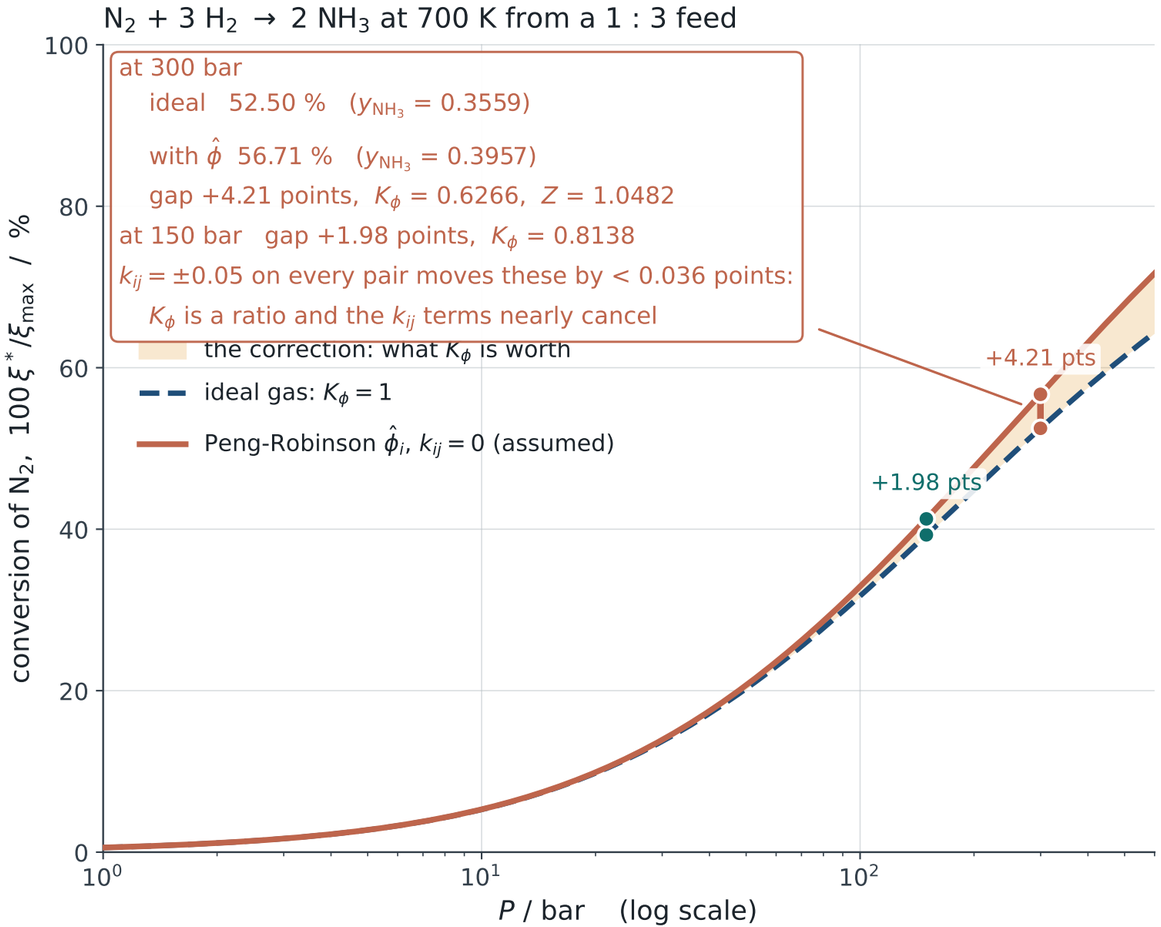
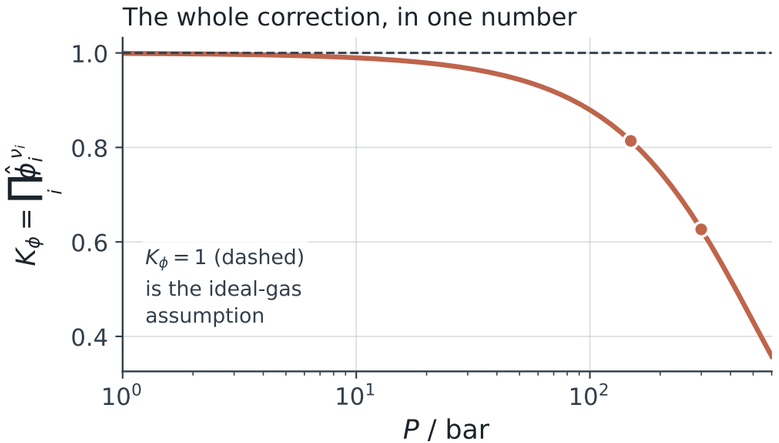
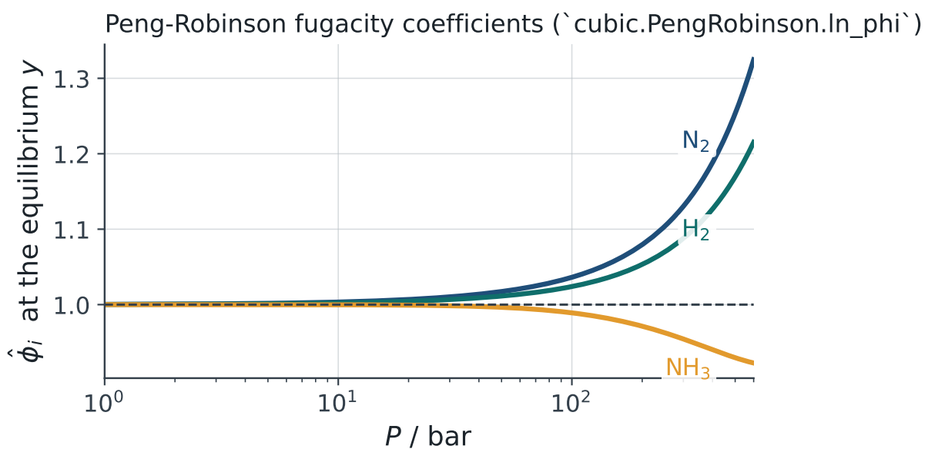
At 300 bar the fugacity coefficient is not a refinement: it is +4.2 percentage points of conversion







ASSUMED, NOT FITTED: $k_{ij} = 0$ for N_2/H_2, N_2/NH_3 and H_2/NH_3. No binary VLE data were regressed here, and none was found in a citable form. Recomputing with $k_{ij} = \pm 0.05$ on every pair changes nothing visible. T_c, P_c, ω from `chemicals`. Hydrogen sits at $T_r = 21$ here, far outside the range the Peng-Robinson $m(\omega)$ polynomial was fitted in — a known weakness, stated rather than corrected. For scale: ±1 kJ/mol on ΔG° moves the 300 bar answer to 58.3 / 55.1 % against 56.7 %.