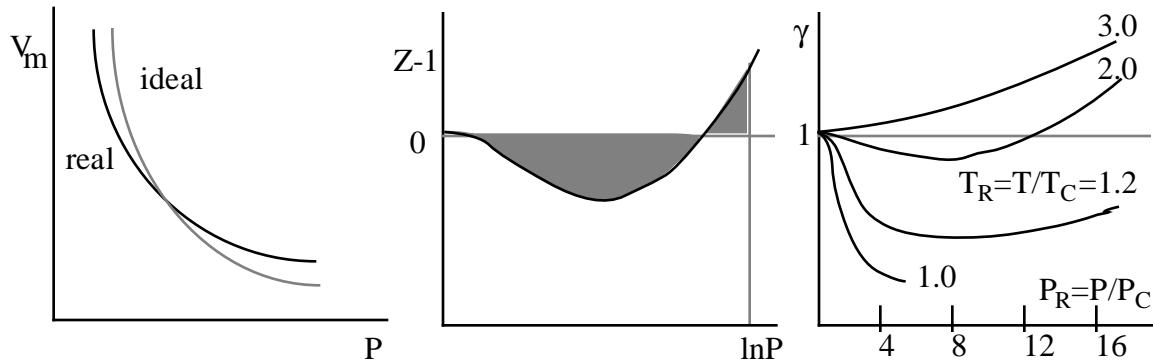


Fugacity-Chemically Effective Pressure



$$\mu = \mu^\ominus + \int_{P^\ominus}^P V_m dP$$

Ideal gas: $\mu^\ominus = \mu^\ominus + RT \ln P/P^\ominus$ $^\ominus$ to remind us that for ideal gas

Real gas: $\mu = \mu^\ominus + RT \ln f/f^\ominus$ at pressure P

$$\text{I. } \mu^\ominus(P) - \mu^\ominus(P') = RT \ln P/P' = \int_{P'}^P V_m^\ominus dP$$

$$\text{II. } \mu(P) - \mu(P') = RT \ln f/f' = \int_{P'}^P V_m dP$$

II-I=

$$RT \ln f/f' - RT \ln P/P' = \int_{P'}^P V_m dP - \int_{P'}^P V_m^\ominus dP = \int_{P'}^P (V_m - V_m^\ominus) dP$$

as $P' \rightarrow 0$ then $f' \rightarrow P'$

$$RT \ln f/P = \int_0^P (V_m - V_m^\ominus) dP$$

$$\ln f/P = \int_0^P (Z-1) \frac{dP}{P}$$

$$\ln f/P = \int_0^P (Z-1) d \ln P$$