**The IG model:** The IG (Ideal Gas) model is the most accurate gas model. At low pressure and/or high temperature (relative to the critical values), a vapor behaves like an ideal gas.

20

40

60

CO2

H2O

O2

Ar, He,Ne, Kr, Xe, Rn



, K

1000

2000

3000

**Fig. 3.51** for various gases as a function of temperature. Noble gases are true perfect gases.

**Assumptions:**

(i) An ideal gas obeys the ideal gas equation of state:

 (1)

.

(ii) For both the IG and PG models,is assumed to be a function of temperature only (it is actually a corollary to the first assumption.

**IG model equations:** (Constant value of  and are read from tables, where  (2)

 ,   (use ideal gas tables);  (3)

**General state equations:** (Applies to any substance)

 ; ; ; ; ; ;  (4)

 ; ; ;  (5)

 ; ; ;  (6)

 ; ;  (7)

**Reference:** Chapter 1 introduces the concept of states and properties, Chapter 3 covers various material models and state evaluation, and Chapter 11 introduces advanced concepts on property evaluation. Read more about the IG model in Sec. 3.5.2.