**INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY**

**Department of Metallurgical Engineering and Materials Science**

**MM 202: THERMODYNAMICS : 2019-20: Fall**

**Tutorial No. 8: Date: Oct 04, 2019**

1. (a) 100 g of liquid iron-manganese solution, at 1873K, is in equilibrium with 20 g of a FeO-MnO liquid solution with XMnO = 0.1. The total pressure is 1 atm. MnO and FeO *liquid* solution is ideal, when the respective standard states are *pure liquids* (even if metastable).
   1. Calculate percentage Mn dissolved in iron and
   2. pO2 in the gas phase

Mn may be assumed to follow Henry’s law in iron, with γoMn = 1.30 at 1873K.

FeO liquid is stoichiometric. So is MnO liquid.

[HINT: O2 should be in equilibrium simultaneously with Fe-FeO and Mn-MnO systems].

1. If the gas phase also contained H2 and H2O, what is the pH2/pH2O ratio?