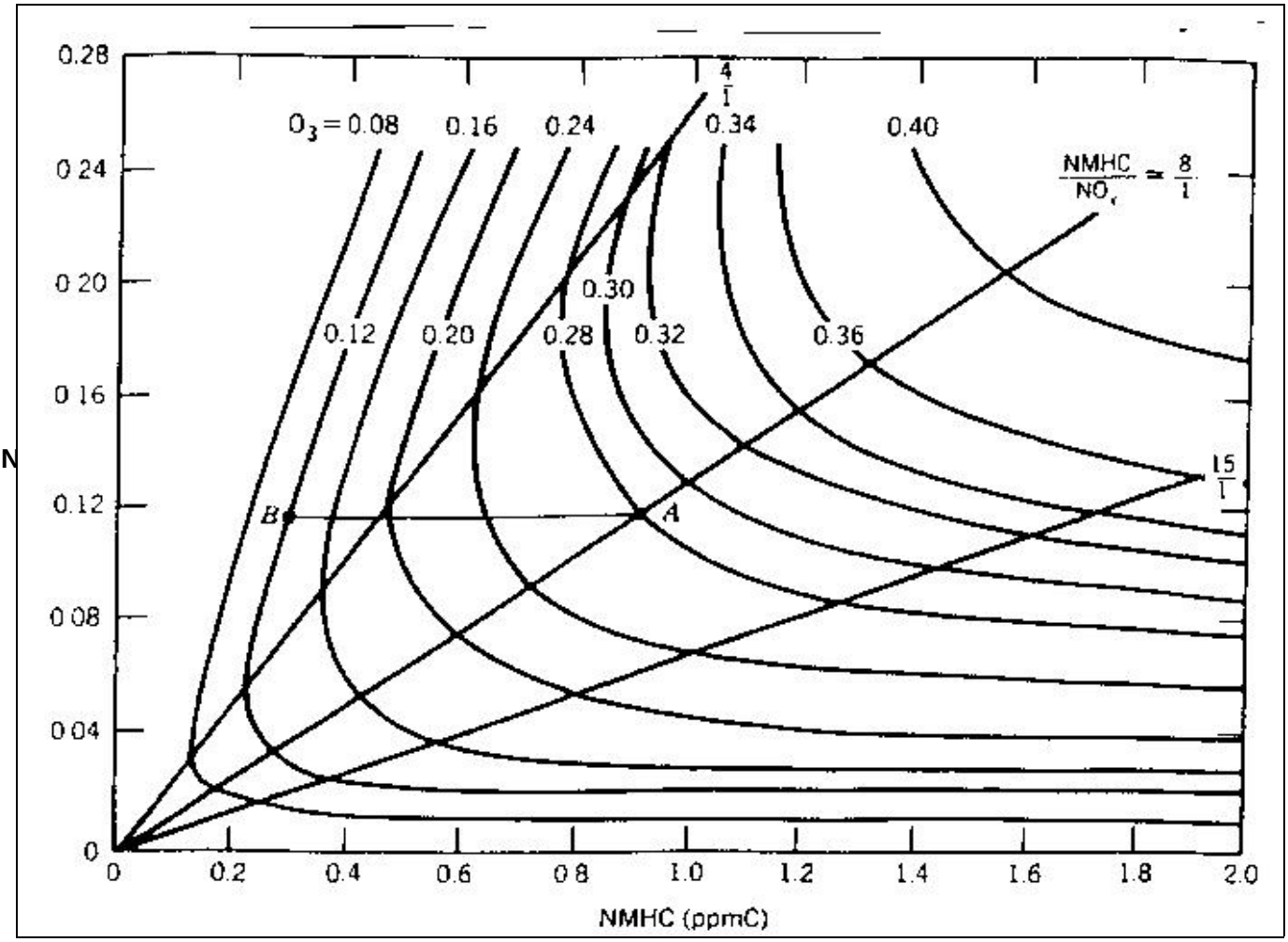
HW 4 Reduction in NMHC to Achieve Old 1-hr Ozone NAAQS of 0.12 ppm

Name: _____

Due Thursday Oct. 22, 2009

Given A certain city has ozone monitors which show that the maximum 1-hour average ozone conc = 0.24 ppm = 240 ppb (this is a peak hourly ozone concentration). The 1-hr NOx conc remains constant at 0.08 ppm and is expected to remain at this 0.08 ppm level. Use the EKMA ("Empirical Kinetic Modeling Approach") diagram below to find out the % reduction in this city's nonmethane hydrocarbon concentration needed to achieve the old 1996 EPA Federal NAAQS standard ozone concentration in ambient air of 0.12 ppm 1-hr average ozone. Note that the classic EKMA diagrams uses 1 hour average concentrations of NOx, NMHC, and ozone.

$ppm := 1 \cdot 10^{-6}$ $ppb := 1 \cdot 10^{-9}$ $ppb = 1 \times 10^{-3}\,ppm$



Find:

a) NMHC conc. when ozone is 0.24 ppm or 240 ppb & NOx is 0.08 ppm _____

b) NMHC conc. when O_3 = old NAAQS of 0.12 ppm or 120 ppb & NOx = 0.08 ppm _____

c) % Reduction in 1 hr average Non Methane Hydrocarbon Conc. needed to meet 0.12ppm or 120 ppb 1 hr average ozone NAAQS. _____

NMHCat240ppbOzone := ▪ **NMHCat120ppbOzone :=** ▪

$$NMHCReductionPercent := \frac{(NMHCat240ppbOzone - NMHCat120ppbOzone) \cdot 100}{(NMHCat240ppbOzone)}$$

NMHCReductionPercent = ▪