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Department of Chemistry

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Chemistry C2407x, 1999

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## Homework Assignment 1

### Kinetic Theory of Gases

**Required reading, no lectures: Oxtoby section 4.2, pp 101-103 (pressure units), problems 4.5, 4.6, 4.9, 4.10; and section 4.3, pp 108-110 (units for R)**

**Lectures cover pages 113-123 in Oxtoby (Sections 4.5, 4.6), and pages 206-214 (Sections 7.2, 7.3)**

**Do Oxtoby Chapter 4 Problems: 4.41-4.43; 4.48,4.49 and 4.52, 4.53. In problems 4.52, 4.53 you may ignore the part of the question having to do with diffusion. Also do Oxtoby Chapter 7 Problems: 7.1, 7.2.**

**In addition calculate the collision frequency for:**

- (a) a sample of oxygen at 1.00 atm. Pressure and 25<sup>0</sup> C
- (b) a molecule of hydrogen in a region of interstellar space where the number density is  $1.0 \times 10^{10}$  molecules per cubic meter and the temperature is 30 K.

**[Take the diameter of oxygen to be  $2.92 \times 10^{-10}$  meter and that of hydrogen to be  $2.34 \times 10^{-10}$  meter.]**

**Suggested date for completion of above assignment: 9/20/99**

### Binary Collision Model

**Lectures cover pages 472-473 in Oxtoby (Section 13.6), and pages 468-472 (Section 13.5)**

**Do Oxtoby Chapter 13 Problems: 13.43, 13.44**

**Suggested date for finishing: 9/27/99**

**This ends the material for exam 1.**