

# Thermal Physics

## Chapter 13-15 Assignments and Answers

### Assignments

**Ch. 13 Problem Assignment:**

HW due: \_\_\_\_\_

Work textbook pg. 380-382 Problems

#3, 27, 9, 10, 11, 13, 14, 29, 30, 31, 33, 35, 41, 42, 46, 47, 49, 52, 55

**Ch. 14 Problem Assignment:**

HW due: \_\_\_\_\_

Work textbook pg. 405-406 Problems #33, 36, 37, 41

**Ch. 15 Problem Assignment:**

HW due: \_\_\_\_\_

Work textbook pg. 433-437 Problems #1, 2, 4, 5, 6, 7, 8, 10, 61, 17, 19, 20, 24, 26

### Answers

**Chapter 13:**3.a.  $20^{\circ}\text{C}$ b.  $3300^{\circ}\text{F}$ 27.  $-459.67^{\circ}\text{F}$ 

9. 8.3cm

10.  $-69^{\circ}\text{C}$ 11.  $981\text{kg}/\text{m}^3$ 

13. 5.12mL

14.a.  $5\text{E}^{-5}\text{ }^{\circ}\text{C}^{-1}$ 

b. Copper

29.  $1.07\text{m}^3$ 30.  $1030^{\circ}\text{C}$ 31.  $1.43\text{kg}/\text{m}^3$ 33.  $14.806\text{m}^3, 1.81\text{atm}$ 35.  $2.4\text{E}^8\text{ Pa}$ 41.  $2.69\text{E}^{25}\text{ molecules}/\text{m}^3$ 42. 55.56mol,  $3.346\text{E}^{25}$  molecules46.a.  $5.65\text{E}^{-21}\text{J}$ 

b. 7302J

47. 6116m/s

49.  $899^{\circ}\text{C}$ 

52. 1.41

55. 386m/s

**Chapter 14:**

33. 83W

36.  $8\times 10^{-4}\text{m}$ 

37. 22.4 bulbs

41.  $10^{\circ}\text{C}$

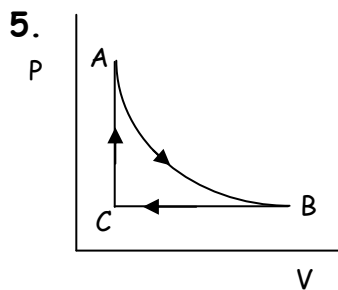
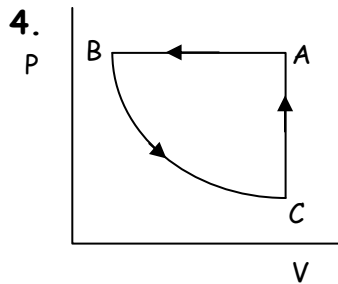
### Chapter 15:

1.a.  $\Delta U = 0$

b.  $Q = 3400\text{J}$

2.a.  $W_{\text{by}} = 6.262\text{E}^5\text{J}$

b.  $\Delta U = +5.234\text{E}^6\text{J}$



6.a.  $W = 0\text{J}$

b.  $\Delta U = -265,000\text{J}$

7.a.  $Q = 0\text{J}$

b.  $\Delta U = +1850\text{J}$

c. Rise

8.a.  $W_{\text{by}} = 78.8\text{J}$

b.  $Q = +78.8\text{J}$

10.a.  $W_{\text{by}} = 353.5\text{J}$

b.  $\Delta U = 0\text{J}$

c.  $Q = +353.5\text{J}$  (into)

61.a.  $W_{\text{ADC}} = P_A(V_C - V_A)$

b.  $W_{\text{ABC}} = P_C(V_C - V_A)$

c.  $W_{\text{AC}} = \frac{1}{2}(P_A + P_C)(V_C - V_A)$

17. 28.1%

19. 23.4%

20.  $425.6^\circ\text{C}$

24. 1831W

26.  $638.6^\circ\text{C}$