

Practice Test 2B

Answer Section

MULTIPLE CHOICE

1. ANS: D

The valence electrons are those in the highest unfilled energy level. Therefore the valence electrons are the two 4s electrons.

PTS: 1

2. ANS: B

$$5200 \text{ \AA} \times \frac{1 \text{ m}}{10^{10} \text{ \AA}} = 5.2 \times 10^{-7} \text{ m}$$

$$E = h\nu = \frac{hc}{\lambda} = \frac{(6.63 \times 10^{-34} \text{ Js})(3.00 \times 10^8 \text{ m/s})}{5.2 \times 10^{-7} \text{ m}} = 3.8 \times 10^{-19} \text{ J}$$

PTS: 1

3. ANS: C

$$\Delta T = \frac{q}{m \times s} = \frac{505 \text{ J}}{11.3 \text{ g} \times 4.18 \text{ J/gC}} = 10.7 \text{ C}$$

$$T_f = T_i + \Delta T = 28.3 + 10.7 = 39.0 \text{ C}$$

PTS: 1

4. ANS: A

$$\text{Reverse equation 1} \quad \Delta H = -83.7 \text{ kJ}$$

$$\text{Divide equation 2 by 2} \quad \Delta H = 90.2 \text{ kJ}$$

$$\text{Leave equation 3 as is} \quad \Delta H = 33.2 \text{ kJ}$$

$$\text{Add the 3 modified equations} \quad \Delta H = 39.7 \text{ kJ}$$

PTS: 1

5. ANS: D

$$99.1 \text{ MHz} = 9.91 \times 10^7 \text{ s}^{-1}$$

$$\lambda = \frac{c}{\nu} = \frac{3.00 \times 10^8 \text{ m/s}}{9.91 \times 10^7 \text{ s}^{-1}} = 3.03 \text{ m}$$

PTS: 1

6. ANS: C

Atomic radius decreases across a period and increases down a group. Therefore the element furthest to the right and highest in the group would be the smallest.

PTS: 1

7. ANS: D

Na has one 3s unpaired electron, therefore it is paramagnetic. All the other elements have no unpaired electrons and are diamagnetic.

PTS: 1

8. ANS: C

In the second experiment 5 times less heat is produced (5 times less reactants). Since 5 times less heat is used to heat 5 times less solution, the change in temperature would be the same for both experiments.

PTS: 1

9. ANS: B

$$725 \text{ kJ} \times \frac{2 \text{ mol Fe}}{850 \text{ kJ}} \times \frac{55.85 \text{ g}}{1 \text{ mol Fe}} = 95 \text{ g}$$

PTS: 1

10. ANS: D

The possible number of orbitals on any energy level is n^2 .

PTS: 1

11. ANS: A

IE and EA values increase as one moves across a period from left to right.

PTS: 1

12. ANS: D

The maximum number of electrons on any energy level is $2n^2$.

PTS: 1

13. ANS: B

See periodic table for energy order of orbitals.

PTS: 1

14. ANS: C

IE_1 values are highest on the top right corner and lowest on lower left corner of periodic table.

PTS: 1

15. ANS: A

d orbital has $l=2$ value. Therefore the possible m_l values would be -2 to +2.

PTS: 1