STAAR CHEMISTRY REFERENCE MATERIALS

ATOMIC STRUCTURE

Speed of light = (frequency)(wavelength) $c = f\lambda$

Energy = (Planck's constant)(frequency) $E_{photon} = hf$

$$\text{Energy} = \frac{(\text{Planck's constant})(\text{speed of light})}{(\text{wavelength})} \qquad E_{photon} = \frac{hc}{\lambda}$$

BEHAVIOR OF GASES

Total pressure of a gas = (sum of the partial pressures of the component gases) $P_T = P_1 + P_2 + P_3 + \ldots$

(Pressure)(volume) = (mo $PV = nRT$

(Initial pressure)(initial volu / (Initial moles)(initial tempera $\frac{P_1V_1}{n_1T_1} = \frac{P_2V_2}{n_2T_2}$

(Initial pressure)(initial $P_1V_1 = P_2V_2$

(Initial volume) / (Initial temperature) = (f / (fina $\frac{V_1}{T_1} = \frac{V_2}{T_2}$

(Initial volume) / (Initial moles) = (final vo / (final m $\frac{V_1}{n_1} = \frac{V_2}{n_2}$

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To download a free, complete version of the STAAR Chemistry Reference Materials, visit www.tea.state.tx.us/student.assessment/staar/.

Provide students with a durable reference chart for year-round use, so that they can fully understand what material is provided on the charts and how to use it to solve problems.

Teacher's Tip
Give your students a little extra motivation to hang on to their reference charts during the school year. Tell your students, "If you have your reference chart on class test days, then you may use it during my tests. If you do not have your reference chart ... (too bad)."

SOLUTIONS

Molarity = moles of solute / liter of solution $M = \frac{\text{mol}}{\text{L}}$

Ionization constant of wa $K_w = [H^+][OH^-]$

(Volume of solution 1)(molarity of solution 1) = ($V_1M_1 = V_2M_2$

pH = –logarithm (hydrogen ion concentration) $pH = -\log[H^+]$

THERMOCHEMISTRY

Heat gained or lost = (mass)(specific heat)(change in temperature) $Q = mc_p\Delta T$

Enthalpy of reaction = (enthalpy of products) – (enthalpy of reactants) $\Delta H = \Delta H_f^o(\text{products}) - \Delta H_f^o(\text{reactants})$