Catalogue of images for Physical Chemistry **UPDATED 30th August 2011**

Phys0001: Silhouette clipart of relay runners passing a baton

Phys0001w: same as above with a white background

Phys0002: Silhouette clipart of climbers on a mountaintop

Phys0002w: same as above with a white background

Phys0003: Test-tube system shown with surroundings and universe

Phys0004: 3 test-tube systems showing difference between open, closed and isolated systems

Phys0004w: same as above with a white background

Phys0005: 3 systems, showing how matter and energy behave differently in open, closed and isolated systems

Phys0005w: same as above with a white background

Phys0006: Diagram showing a system transferring energy as work to its surroundings and the effect of energy as work on those surroundings

Phys0007: Diagram showing a system transferring energy as heat to its surroundings and the effect of energy as heat on those surroundings

Phys0008: Diagram showing how a closed reaction system can do work on its surroundings by the production of a gas

Phys0008w: same as above with a white background

Phys0009: Diagram showing how it is possible to measure the work done by gas expansion using the initial and final states of a system to find the change in volume

Phys0009w: same as above with a white background

Phys0010: Diagram illustrating how enthalpy of a reaction as a state function is independent of the path a reaction has taken, and is only reliant on the initial and final states of said reaction

Phys0010w: same as above with a white background

Phys0011: Hess’s law diagram showing how a reaction proceeds, reactants -> elements -> products

Phys0011w: same as above with a white background

Phys0012: Hess’s law diagram showing enthalpies of formation for reactants and products, and how these can be used to determine reaction enthalpy

Phys0012w: same as above with a white background

Phys0013: Diagram showing the difference between spontaneous and non-spontaneous processes, using diffusion as an example

Phys0014: Diagram showing that an ideal gas expanding into a vacuum does not change it’s energy, energy is not the driving force of spontaneity

Phys0014w: same as above with a white background

Phys0015: Diagram showing that a spontaneous process leads to dispersal of the energy of an isolated system, using a bouncing ball as an example, with each bounce the kinetic energy of the ball disperses into the atoms in the ball and in the floor

Phys0016: Diagram showing dispersal of heat energy from one substance to another (from the upper to the lower) as spontaneous, whilst the opposite is non-spontaneous

Phys0017: Diagram showing statistical entropy of a small system containing 4 molecules and 3 energy levels, showing the 19 possible arrangements with a fixed total energy and giving the Weight of the system as 19

Phys0017w: same as above with a white background

Phys0018: Clip art of a sneezing man

Phys0018w: same as above with a white background

Phys0019: Sketch graph to show the change in entropy for the expansion of a perfect gas

Phys0019w: same as above with a white background

Phys0020: Diagram showing the different states of matter, solid, liquid and gas and the differences between them

Phys0020w: same as above with a white background

Phys0021: Silhouette clip art of a confused person

Phys0021w: same as above with a white background

Phys0022: Sketch graph showing the change in concentration of 3 species with pH

Phys0022w: same as above with a white background

Phys0023: Sketch graph showing the pH change during a titration of a strong base into a strong acid

Phys0023w: same as above with a white background

Phys0024: Sketch graph showing the pH change during a titration of a strong base into a weak acid

Phys0024w: same as above with a white background

Phys0025: Sketch graph showing the pH change during a titration of a strong base into a weak acid, also showing how to find pKa from such a titration

Phys0025w: same as above with a white background

Phys0026: Sketch showing hydrogen bonds in both liquid and solid water

Phys0026w: same as above with a white background

Phys0027: Diagram showing how ions interact in solution

Phys0027w: same as above with a white background

Phys0028: Diagram showing an ionic solution and conductivity bridge

Phys0028w: same as above with a white background

Phys0029: Diagram showing proton transfer via hydrogen bonding, known as a Grotthus mechanism

Phys0029w: same as above with a white background

Phys0030: Diagram showing an electrochemical cell with electrodes and electrolyte

Phys0030w: same as above with a white background

Phys0031: Diagram showing an electrochemical cells linked by a salt bridge, ie. Daniel cell

Phys0031w: same as above with a white background

Phys0032: Diagram showing an electrochemical cells linked by a salt bridge, with example of cell contents

Phys0032w: same as above with a white background

Phys0033: Diagram showing a standard hydrogen electrode

Phys0034: Series of 3 sketch graphs showing the general trend of the changing concentration of products and reactants over a chemical reaction

Phys0035: Series of 3 sketch graphs showing how to find the gradient of a curve using tangents

Phys0036: Sketch graphs showing how to convert a curve for a first order reaction into a straight line graph to obtain the rate constant, using the natural log function

Phys0037: Sketch graph showing how to use a concentration/time graph to find the ½ life for a given first order reaction

Phys0038: Sketch graphs showing that the curve for a zero order reaction is a straight line though the origin

Phys0039: Sketch graph showing how to use a concentration/time graph to find the ½ life for a given zero order reaction

Phys0040: Sketch graphs showing how to convert a curve for a first order reaction into a straight line graph to obtain the rate constant, using 1/[A]

Phys0041: Sketch graph showing how to use a concentration/time graph to find the ½ life for a given second order reaction

Phys0042: Sketch graphs showing reaction coordinate for exo- and endothermic reactions

Phys0043: Sketch graph showing how to find activation energy from a rate against temperature graph