levels in atoms of the mercury vapour, so mercury atoms are excited and kinetic energy of electrons becomes excitation energy of mercury; the kinetic energy of the electrons is not conserved.

2/2

d) Wrong! Term values are the reciprocal of the ionizing wavelength for each energy level. Differences in term values give reciprocals of wavelength

1/2

e) Absorption edges occur for each photon frequency corresponding to removal of an electron from a particular shell, which must be one of the innermost shells as the energy required to remove an electron from an outer shell is much less likely to correspond to x-ray frequencies.

3/2

f) $\frac{1}{\lambda} = R_H\left(\frac{1}{n_2^2} - \frac{1}{n_1^2}\right)$

$= 1.097E7\left(\frac{1}{109^2} - \frac{1}{110^2}\right)$ m^{-1}

$= 5.984 \times 10^{-2}$ m

You should not use this notation!

$c = f\lambda \Rightarrow f = \frac{c}{\lambda}$

2/2

$f = \frac{3E8}{5.98E-2} = 5E9$ Hz right.

??

g) This is wrong. Wavelengths & frequencies of spectral lines are trivially dependant* on how many neutrons are in the nucleus, as shown by the eqtn for the wavelengths of those lines $\frac{1}{\lambda} = R_H Z^2\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$

*in most cases

2/2

ie isotopes have the same spectral lines (virtually).

13/14

R depends (slightly) on nuclear mass