

M1. (a) Electron transitions/electrons excited in d shell **(1)** or d-d transition
Do NOT allow charge transfer

(Energy in) visible range **(1)**
(NOT emits in visible region)

2

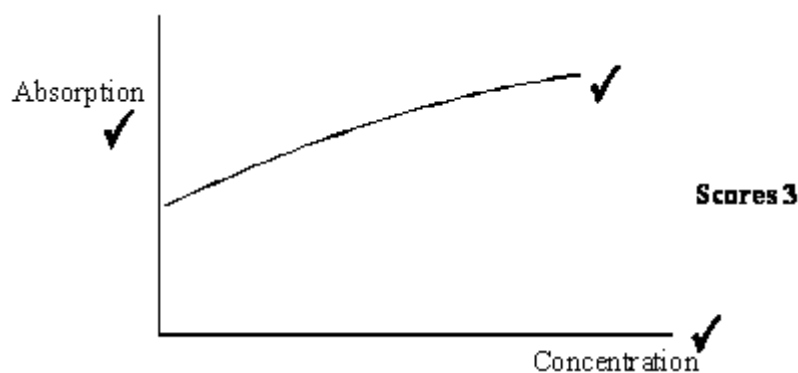
(b) *Change 1:* (Different) oxidation states **(1)**
Change 2: (Different) ligands **(1)**
Change 3: (Different) co-ordination number **(1)**
Do not allow shape as an answer

3

(c) Add an appropriate (or a given correct) ligand to intensify colour **(1)**
e.g. thiocyanate (CNS)⁻ or bipyridyl
Make up solutions of known concentration **(1)**
Measure absorption or transmission **(1)**
Plot graph of results or calibration curve **(1)**
Measure absorption of unknown and **(1)**
compare

N.B.: Allow concentration statement if included in graph statement

Allow adsorption but circle the d
Also



5

[10]