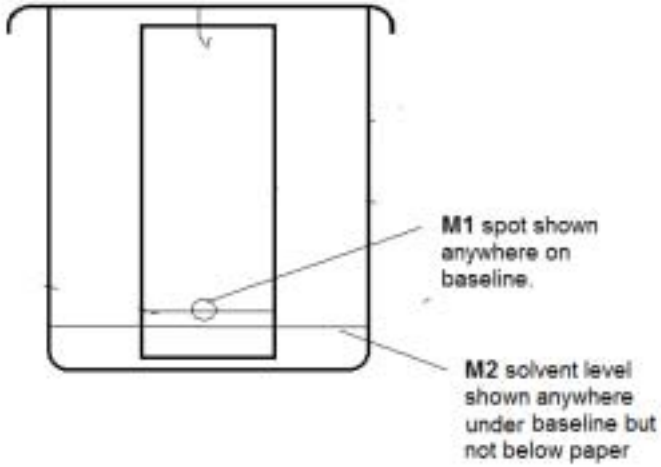
Question	Answer	Marks
1(a)	**A** mortar	**1**
	B tripod	**1**
	C (filter) funnel	**1**
1(b)(i)		**1** **1**
1(b)(ii)	pencil is not soluble / pencil does not run / smudge / dissolve / change results	**1**
1(c)(i)	two	**1**
1(c)(ii)	anthocyanin	**1**

Question	Answer	Marks
2(a)	all temperatures and temperature changes completed and all temperatures and temperature changes recorded to the same precision	**1**
	all temperatures recorded correctly (22.0, 22.0, 22.0, 22.5, 23.0, 23.0) and (19.5, 17.0, 14.5, 13.5, 14.0, 14.0)	**2**
	all temperature changes calculated correctly (2.5, 5.0, 7.5, 9.0, 9.0, 9.0)	**1**
2(b)	all points plotted correctly	**1**
	ruler drawn straight line through first 4 points	**1**
	(ruler) drawn straight line through last three points	**1**
	straight lines have been extended so that they meet / cross	**1**
2(c)(i)	values read correctly from graph (9.0 °C **and** 3.6 g)	**1**
	correct indication on graph	**1**
	units (°C **and** g)	**1**
2(c)(ii)	(all) acid used up / sodium hydrogen carbonate in excess	**1**
2(d)	correct line should be identical to plotted line up to 1.8 g and then becomes horizontal. temp change of between 4.0 and 5.0 where line becomes horizontal / levels off	**1**
	mass of between 1.0 and 2.5 where line becomes horizontal / levels off	**1**

Question	Answer	Marks
2(e)	change: use a pipette	**1**
	explanation: more accurate than a measuring cylinder	**1**
	change: use a polystyrene / styrofoam cup	**1**
	explanation: insulator / reduces heat gain	**1**
Tests on solid E		
3(a)	hydrated / contains water (of crystallisation)	**1**
3(b)	not a halide	**1**
3(c)	ammonium / NH_4^+	**1**
	aluminium / Al^{3+}	**1**
	sulfate / SO_4^{2-}	**1**
Tests on solid F		
3(d)	yellow	**1**
3(e)(i)	blue	**1**
3(e)(ii)	blue ppt	**1**

Question	Answer	Marks
4	Any 6 from: • stated / set / same / measured volume of acid • stated / set / same / measured mass of calcium carbonate • add / combine / put together **and** start timing • Repeat (with acid) at higher / lower temperature **then:** • graphical method: • measure / record mass at known / regular / specified times • plot graph • steepest line is fastest **OR** mass loss in a set time • measure / record mass at a specified time • calculate / measure mass lost • largest mass loss is fastest or calculates rate by mass loss ÷ time **OR** time to end of reaction • react until mass stops changing / reaction stops • record time • shortest time is fastest or calculates rate by mass loss ÷ time **OR** time to lose a set mass • react until it reaches / loses a certain mass • record time • shortest time is fastest or calculates rate by mass loss ÷ time **OR** mass of calcium carbonate left after a set time • filter after a set time • find mass of calcium carbonate left • lower mass of calcium carbonate is fastest or calculates rate by mass **loss** ÷ time	**6**