Question	Marking guidance	Mark	AO	Comments
06.1				Extended response Maximum of 7 marks for answers which do not show a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.
	Stage 1: appreciation that the acid must be in excess and calculation of amount of solid that permits this.			
	Statement that there must be an excess of acid	1	AO2d	
	Moles of acid = 50.0 × 0.200/1000 = 1.00 × 10^{-2} mol	1	AO3 2a	
	2 mol of acid react with 1 mol of calcium hydroxide therefore moles of solid weighed out must be less than half the moles of acid = 0.5 × 1.00 × 10^{-2} = 5.00 × 10^{-3} mol	1	AO3 2b	
	Mass of solid must be < 5.00 × 10^{-3} × 74.1 = < 0.371 g	1	AO3 2a	
	Stage 2: Experimental method.			
	Measure out 50 cm^3 of acid using a pipette and add the weighed amount of solid in a conical flask	1	AO3 2b	
	Titrate against 0.100 (or 0.200) mol dm^{-3} NaOH added from a burette and record the volume (v) when an added indicator changes colour	1	AO3 2b	
	Stage 3: How to calculate M_r from the experimental data.			
	Moles of calcium hydroxide = 5.00 × 10^{-3} – (v/2 × conc NaOH)/1000 = z mol	1	AO3 2a	
	M_r = mass of solid / z	1	AO3 2a	

06.2	Moles of calcium chloride = 3.56 / 111.1 = 3.204×10^{-2}	1	AO2h	
	Moles of calcium sulfate = $3.204 \times 10^{-2} \times 83.4/100 = 2.672 \times 10^{-2}$	1	AO2h	
	Mass of calcium sulfate = $2.672 \times 10^{-2} \times 136.2 = 3.6398 = 3.64$ (g)	1	AO2h	Answer must be to 3 significant figures