KEY

A. Qualitative Analysis ~20%	pts		pts
1. Magnesium Sulfate, Epsom Salt $MgSO_4$	4	17. Boric Acid	1
2. Calcium Nitrate, $Ca(NO_3)_2$	4	18. NH_4Cl	1
3. Calcium Carbonate, Marble limestone, $CaCO_3$	4	**B. Polymers (plastics/fibers/hair) (~20%)**	
4. Calcium Sulfate, (Gypsum) $CaSO_4$	4	19. spandex	5
5. Magnesium Sulfate, Epsom Salt $MgSO_4$	4	20. cotton	5
6. Sodium Chloride, Table Salt, NaCl	4	21. linen	5
7. Sodium Acetate $C_2H_3NaO_2$	4	22. cotton	5
8. Cornstarch $[C_{27}H_{48}O_{20}]$ varies	4	23 silk	5
9. Sucrose $C_{12}H_{22}O_{11}$	4	24. wool	5
10. Sodium Bicarbonate (Baking Soda) $NaHCO_3$	4	25. wool	5
11. Sodium Acetate $C_2H_3NaO_2$	4	26. bat hair	1
12 $C_6H_{12}O_6$	1	27. Just 21--linen	2
13 A used as a desiccant, as part of pyrotechnics, in refrigeration machines	1	28. individual	1
13 B , to manufacture mineral water and for soldering aluminum	1	29. class	1
13. C D all of the above	1	30. $\frac{\text{width of medulla}}{\text{width of hair}}$	1
14. Carbonate $[CO_3]$	1	31. Anagen	2
15. used to test for simple carbohydrates. When reducing sugars are mixed with Benedicts reagent and heated, a reduction reaction causes the Benedicts reagent to change color.	1	32. Catagen	2
16. Table Sugar or just Sugar	1	33. Telogen	2

34. A Coronal--crown like	1		46. patent	2
34 B Spinous – petal like	1		47. plastic	2
34 Imbricate C – flattened overlapping scales	1		48. 2 and 5	6
35. Keratin	1		49. concentric fractures	2
C.Chromatography/Spectroscopy (~15%)			50. radial fractures	2
36. #4	6		51. 49 A series of broken circles originate on the surface on which force is applied around the point of impact. These are secondary fractures, concentric fractures	2
37. Water A solvent in chromatography is the liquid the paper is placed in	4		52. side where force applied	2
38. Ink the solute is the ink which is being separated	4		53 radial cracks	2
39 distance origin to center of color distance origin to solvent front	6		54 radial cracks	2
40. A .15	2		55 True	2
40. B .87	2		**E. Analysis of the Crime (~30%)**	
40. C .38	2		56. # 4	2
41. 86	4		Written Analysis	80
42. 57	4		Explain your reasoning .Full sentences are NOT necessary...but make sure what you are saying is clear and easy to follow. What evidence / reasoning—opportunity/motive/etc. points to the specific suspect(s) and why did you rule out other suspects? A table or chart would be fine to show your results **as long as you include an explanation of the chart**. (please ask for additional paper if you need it)	
43. The most intense ion is assigned an abundance of 100, and it is referred to as the **base peak**.	4			
D. Crime Scene Physical Evidence (~15%)				
44. #4	6			
45. No one	6			