Fall 2010.

1) 2.75 x 10−8 2) 147 mL 3) Nitrogen tribromide 4) +84.68 kJ 5) Ni(NO3)3

6) ammonium sulfate 7) q 8) 3 9) 74 10. 32.0 g 11. 9.0 g

12. BaH2O2 or Ba(OH)2 13. 51.16 % 14. 3.84 g 15. D

16. C 17. A 18. −1723.44 kJ 19. 36.9 20. A 21. 2 22. Y 23. K

24. O 25. Fe2+ 26. 47.6 grams. 27. 13 28. 3+ 29. 16 30 6

31. A 32. C 33. A 34. D 35. D 36. B 37. A

38. Omit the hybridization, which was not covered at Brooklyn. (It IS covered at Touro, so I am including the answers) CO2 is linear, linear, sp, not a dipole.

NO3− is trig planar, trig planar, sp2. CH2Cl2 is tetrahedral, tetrahedral sp3 NOT a dipole. SO32- is tetrahedral, trigonal pyramid, sp3, and H2CO is trig planar, trig planar, sp2 and YES, a dipole. The last entry could be any of a huge number of compounds.

CH4 is the most obvious. It should be a molecule, not an ion. The hyb. is sp3

38. Resonance is a factor in SO3 and O3 and not in NBr3 Sulfur trioxide is not a dipole, because it is trigonal planar and the centers of + and - charge are in the same place. (or, does not have two different sides). Nitrogen tribromide IS a dipole, because it has a pyramidal shape, where the top and bottom have different charge.

39. CH3 7.5 grams. 30 C2H6 2 C2H6 + 7 O2 → 4 CO2 + 6 H2O

40. Ca2+ (aq) + CO32- (aq) → CaCO3(s) (No deduction if aq and s are omitted)

H+ (aq) + OH- (aq) → H2O(ℓ)

Note to Brooklyn College students - I would not ask an extra credit problem like that. It was for Touro, which is a Jewish school. It would be inappropriate at Brooklyn.

Answers could have included Pauli, Haber, Born, Meitner. (biologists, such as Paul Ehrlich, or Jonas Salk, were not accepted)