Appendix

Preperation of Common Laboratory Reagents

1. **Bromine water** : Shake 5 mL of liquid bromine with 100 ml of distilled water in a conical flask. Decant off the clean solution into a bottle and stopper it.
2. **Bromine in CCl_4 :** Shake 4 mL of liquid bromine with 100 mL of carbon tetrachloride and stopper the bottle.
3. **Alkaline potassium permanganate solution :** (Baeyer's Reagent) Dissolve l g of solid potassium permanganate in 100 mL of distilled water, then add 10g of anhydrous sodium carbonate. Shake the mixture to dissolve it and stopper the bottle.
4. **Neutral ferric chloride :** Place 2 mL ferric chloride solution in a clean test tube. Add ammonium hydroxide until a brown precipitate just appears. Now add the original ferric chloride solution until the precipitate just disappears. (Prepare fresh for a day)
5. **2, 4- dinitrophenyl hydrazine (2, 4 - DNP) :** Dissolve 2 g of 2, 4-DNP in 100 mL methanol to which 4 mL of conc. sulphuric acid is added. Filter if necessary.
6. **Sodium bisulphite solution :** Dissolve 30 g of sodium bisulphite in 100 mL of distilled water.
7. **Schiff's reagent :** Dissolve 0.1 g of fuschine (p-rosaniline hydrochloride) in 100 mL water. Pass sulphur dioxide gas until its red colour is discharged. Filter and use the filtrate.
8. **(a) Fehling's solution A:** Dissolve 35 g of crystalline copper sulphate in 500 mL water. Add 3 mL of concentrated sulphuric acid to it.

   (b) Fehling's solution B: Dissolve 173 g of Rochelle salt (sodium potassium tartarate) and 60 g of sodium hydroxide in 500 mL of water.

Note : (i) Fehling's solution A and Fehling's solution-B are available in the market also.

(ii) Mix equal volumes of A and B solutions just before performing the test.

9. **Tollen's Regent :** Place 2 mL of silver nitrate solution in a clean test tube Add two drops of sodium hydroxide solution (10% solution). A brown precipitate is formed. Now add dilute ammonium hydroxide solution dropwise until the brown precipitate of silver oxide just redissolves.
10. **Conc. sulphuric acid** 18M as supplied may be used.
11. **Conc. hydrochloric acid** 12M as supplied may be used.
12. **Conc. nitric acid** 16 M as supplied may be used.
13. **Acetic acid (glacial** 11M as supplied may be used.
14. **Dil. sulphuric acid** 12M : Pour 111 mL of conc. sulphuric acid slowly and with constant stirring in 500 mL of distilled water. Cool and make up the volume to 1 litre.

15. **Dil. hydrochloric acid** 4M : Add 333.3 mL of conc. HCl in the distilled water and make up the

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16. **Dil nitric acid 4M** : Add 250 mL of Conc. HNO_3 in the distilled water and make up the volume to litre.
17. **Dil. acetic acid** 2M : Add 182 mL of glacial acetic acid in distilled water and make up the volume to 1 litre.
18. **Ammonia solution** 15M as supplied may be used.
19. **Dil. ammonia solution** 4M : Pour 266.6 mL of the conc. ammonia solution in distilled water and make up the volume to 1 litre.
20. **Ammonium chloride** 4M : Dissolve 214 grams of the salt in one litre of water.
21. **Ammonium carbonate** 2M : Dissolve 192 grams of Ammonium carbonate in 1 litre distilled water.
22. **Ammonium acetate** 3M : Dissolve 231 grams of the salt in a litre of distilled water.
23. **Ammonium sulphate** 1M: Dissolve 132 grams of the salt in 1 litre of distilled water.
24. **Ammonium oxalate** 0.5M : Dissolve 71 grams of the salt in 1 litre of distilled water.
25. **Ammonium molybdate** 0.5M : Dissolve 88 grams of the salt in a mixture of 120 mL of conc. ammonia solution and 80 mL of distilled water. Add 240 grams of ammonium nitrate and dilute it to 1 litre water.
26. **Barium chloride** 0.2 M : Dissolve 48.8 grams of the salt in distilled water and make up the volume to 1 litre.
27. **Chlorine water** : Take one litre of distilled water and saturate it with chlorine gas and keep the solution in a dark coloured bottle.
28. **Calcium chloride** 0.2 M : Dissolve 43.8 grams of the salt in distilled water and make up the volume to 1 litre.
29. **Copper sulphate** 0.5M : Dissolve 124.75 grams of the salt in distilled water. Add a few drops of dilute acetic acid and make up the volume to 1 litre.
30. **Cobalt nitrate** 0.15M : Dissolve 43.65 grams of the salt in distilled water and make up the volume to 1 litre.
31. **Dimethyl glyoxime** 1% : Dissolve 10 grams of the solid in ethyl alcohol and make up the volume to 1 litre with distilled water.
32. **Ferric chloride** 0.5M : Dissolve 135 grams of the salt in distilled water. Add 20mL of conc. hydrochloric acid and make up the volume to 1 litre.
33. **Ferrous sulphate** 0.5M : Dissolve 138.5 grams of the salt in distilled water conatining 10mL of conc. sulphuric acid and make up the volume to 1 litre.
34. **Iodine solution** 0.05M : Dissolve 12.7 grams of iodine crystals in distilled water containing 20 grams of potassium iodide and then dilute it to 1 litre.
35. **Lime water** : Dissolve some amount of calcium oxide in distilled water, filter the solution after sometime and keep it in a reagent bottle.

36. **Litmus solution (Blue)** : Dissolve 10 grams of litmus in distilled water and make up the volume to 1 litre.

37. **Litmus solution (Red)** : To the blue litmus solution add about 10 drops of dilute hydrochloric acid.

38. **Lead acetate** 0.1M : Dissolve 37.9 grams of the salt in 500 mL of distilled water containing a little acetic acid and make up the volume to 1 litre.

39. **Methyl orange** : Dissolve 1 gram of the solid in distilled water and make up the volume to 1 litre.

40. **Mercuric chloride** 0.1M : Dissolve 27.2 grams of the salt in the water and make up the volume to 1 litre.

41. **Nesslers reagent** : Dissolve 23 grams of mercuric iodide and 16 grams of potassium iodide in distilled water and make up the volume to 100 mL. Add 150 mL of 4M NaOH solution. Allow it to stand for 24 hours and decant the solution. Solution should be stored in a dark coloured bottle.

42. **Potassium chromate** 0.2M : Dissolve 38.8 grams of the salt in distilled water and make up the volume to 1 litre.

43. **Potassium dichromate** 0.1M : Dissolve 29.4 grams of the salt in distilled water and make up the volume to 1 litre.

44. **Potassium iodide** 0.2M : Dissolve 33.2 grams of the salt in water and make up the volume to 1 litre.

45. **Potassium thiocyanate** 0.2M : Dissolve 19.4 grams of the salt in distilled water and make up the volume to 1 litre.

46. **Potassium permanganate** 0.02M : Dissolve 6.32 grams of the salt in distilled water and make up the volume to 1 litre. Heat the solution and filter it.

47. **Potassium ferrocyanide** 0.1M : Dissolve 42.2 grams of the salt in distilled water and make up the volume to 1 litre.

48. **Potassium ferricyanide** 0.2M : Dissolve 65.8 grams of the salt in distilled water and make up the volume to 1 litre

49. **Phenolphthalein** 0.1% : Dissolve 0.25 grams of the solid in 125 mL of ethyl alcohol and then add 125 mL of distilled water.

50. **Sodium hydroxide** 4M : Dissolve 160 grams of the sodium hydroxide pellets in distilled water

50. **Sodium hydroxide** 4M : Dissolve 160 grams of the sodium hydroxide pellets in distilled water and make up the volume to 1 litre.

51. **Silver nitrate** 0.1M : Dissolve 17 grams of the salt in distilled water and make up the volume to 1 litre and store it in a brown coloured bottle.

52. **Starch** Prepare paste of about 1 gram of starch in cold water and pour it in 100 mL of boiling water with constant stirring. Allow it to cool.

53. **Disodium hydrogen phosphate** 0.1M : Dissolve 35.8 grams of the salt in distilled water and make up the volume to 1 litre.

54. **Sodium nitroprusside** 0.03M : Dissolve 1 gram of the solid in 100 mL of distilled water.

55. **Sodium cobaltinitrate** 0.16M : Dissolve 64.64 grams of the solid in distilled water and make the volume to 1 litre.

56. **Stannous chloride** 0.5M : Dissolve 113 grams of salt in 200 mL of concentrated hydrochloric acid by heating (if necessary). Add several pieces of metallic tin and make up the volume to 1 litre.

57. **Yellow ammonium sulphide** : Take about 200 mL of concentrated ammonia solution in a bottle and saturate it with H_2S gas. Add 10 grams of flowers of sulphur and shake well untill sulphur is completely dissolved. Dilute the solution to one litre with distilled water.