Schneider.

LIST OF TESTS

(REAGENTS)

Arranged in Alphabetical Order according to the Names of the Originators.

Translated from the German

OF

MR. SCHNEIDER (DRESDE),

With Additions from Various Sources,

BY

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Reprinted from the "Pharmaceutical Record," Dec. 15, 1884.

NEW YORK:
P. W. BEDFORD,
No. 36 Beekman Street,
1884.

LIST OF TESTS (REAGENTS).

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THE following list, though not quite complete, will meet a long-felt want. How often, in reading chemical articles, are we met with the statement that this or that chemist's test was employed, the nature of which has escaped our memory, and necessitates a, sometimes fruitless, search through many books of reference. Some of the tests are identical, and a few of them are, or seem to be, contradictory.

HANS M. WILDER.

1. Allen's (carbolic acid). Purple-crimson coloration by muriatic and nitric acids.
2. Almén's (blood). Tincture of guaiacum well shaken with an equal bulk of oil of turpentine. Blue coloration of the separated resin.
3. Barbot's (purity of olive-oil). Nitric acid, containing nitrous acid.
4. Barreswil's (glucose). See *Fehling*.
5. Behrens' (purity of olive-oil). Equal weights of sulphuric and nitric acids.
6. Bettendorff's (arsenic; brown cloudiness). Strongly acid solution of stannous chloride (in muriatic acid) with an addition of sulphuric acid.
7. Boedeker's (albumen). Precipitate by solution of ferrocyanide of potassium in presence of acetic acid.
8. Boettcher's (glucose). Heating solution with a solution of

sodium carbonate in presence of subnitrate or hydrated oxide of bismuth. Separation of gray bismuthous oxide.

9. Boettcher's (ozone). Strip of paper, moistened with an acid-free solution of chloride of gold. Violet coloration.

10. Boettcher's (peroxide of hydrogen). Addition of iodide of cadmium-starch paste and very little protosulphate of iron. Deep ultramarine-blue coloration.

11. Bohlig's (ammonia; white cloudiness). I. Solution of bichloride of mercury (1:30); shows free ammonia and carbonate of ammonium. II. Solution of potassium carbonate (1:50); shows ammonium salts.

12. Bonastre's (myrrh). Violet coloration on adding nitric acid to a strip of filtering-paper moistened with an alcoholic solution of myrrh.

13. Bouchardat's (alkaloids; brown precipitate). Iodo-iodide of potassium=10 iodine, 20 iodide of potassium, 500 water.

14. Boudet's (purity of olive-oil). Nitric acid, containing nitrous acid.

15. Brand's (quinine). Green coloration on treating with chlorine water and adding ammonia.

16. Braun's (nitric acid). Violet-blue coloration on adding a little anilin sulphate and sulphuric acid to a nitrate.

17. Brouardel and Boutmy's (ptomaines from plant alkaloids). Blue coloration on applying ferricyanide (red) of potassium and afterward ferric chloride.

18. Bruecke's (glucose). Boil freshly precipitated, still moist subnitrate of bismuth—obtained from 5½ metallic bismuth—with 30 potassium iodide and 150 water. After ten minutes add 5 twenty-five per cent muriatic acid. Reduction.

19. Buckingham's (alkaloids; color reactions). A freshly prepared solution of 1 molybdate of ammonium in 16 pure concentrated sulphuric acid, and heating of the milky solution till clear.

20. Carpené's (tannin in wines; precipitate). A saturated solution of zinc acetate in five-per-cent ammonia.

21. Creuse's (salicin in sulphate of quinine). Bichromate of potassium and diluted sulphuric acid.

22. Davy's (carbolic acid). Violet coloration by a solution of molybdic acid in concentrated sulphuric acid.

23. Davy's (arsenic; black spots). *Marsh's* method, substituting the diluted acid with an amalgam of mercury and sodium.

24. Day's (pus, matter). Blue coloration on addition of 1 or 2 drops oxidized tincture of guaiacum to urine.

25. Van Deen's (blood). Blue coloration on adding a few drops of freshly prepared tincture of guaiacum and ozonized oil of turpentine to the very diluted liquid.

26. Dragendorff's (alkaloid; reddish-brown precipitate). Potassio-bismuthic iodide. See also *Marmé*.

27. Drechsel's (biliary matter). See *Pettenkofer*.

28. Dudley's (glucose). Nitrate of bismuth dissolved in a little nitric acid, add an equal bulk of acetic acid, and dilute to ten volumes.

29. Duflos' (anilin). Green coloration with sulphuric acid and peroxide of lead.

30. Dupasquier's (organic matter in water). Aqueous solution of chloride of gold.

31. Eboli's (cantharidin). Brilliant green coloration on heating with sulphuric acid and chromate of potassium.

32. Einbrodt's (ammonia). Aqueous solution of corrosive sublimate, made slightly alkaline with potassium carbonate. White cloudiness.

33. Erdmann's (alkaloids; color reactions). Mix 6 drops nitric acid with 100 ccm. water, and take of this 10 drops to 20 ccm. pure concentrated sulphuric acid.

34. Erdmann and Uslar's (alkaloids). See Wiegand's edition of Parrish and Dispensatories.

35. Fehling's (glucose; reduction). 34.639 sulphate of copper dissolved in 200 ccm. water, then mixed with a cold solution of 173 potassium tartrate in 500–600 ccm. solution of caustic soda (1.12), and diluted with water to one litre. 10 ccm.=0.05 glucose. Often called Barreswil's, Frommherz's, Violette's, Trommer's, etc., solution, though Trommer's is different (which see).

36. Fleitmann's (arsenic; black spot). Marsh's method, substituting a strong solution of caustic potassa or sodium for the diluted acid. The evolved gas produces a black spot on a slip of filtering-paper moistened with nitrate of silver.

37. Fraude's (alkaloids; color reactions). Boil with perchloric acid (1.13–1.14).

38. Fresenius (carbolic acid). Separation of metallic mercury and evolution of odor of salicylic aldehyde on boiling with an acid solution of mercurous nitrate.

39. Froehde's (hydrocyanic acid). Blood-red coloration on dipping into a diluted ferric-chloride solution a blowpipe bead of hyposulphite of sodium with a cyanide.

40. Froehde's (alkaloids; color reactions). A freshly prepared solution of 0.01 molybdate of sodium in 1 ccm. pure concentrated sulphuric acid.

41. Frommherz's (glucose). See *Fehling*.

42. Gmelin's (biliary matter). Color reaction on cautiously adding to urine a little nitric acid, containing nitrous acid.

43. Grandeau's (alkaloids). Color reactions on dissolving in sulphuric acid and adding bromine water.

44. Griess' (nitrous acid). Deep-red coloration on addition of anilin-sulphuric acid and afterwards a solution of naphthylamin sulphate.

45. Hager's (glucose; separation of mercurous chloride). 30 red oxide of mercury, 30 acetate of sodium, 50 chloride of sodium, 25 glacial acetic acid, 400 water; after solution dilute to one litre.

46. Haine's (glucose; reduction). 3 sulphate of copper, 9 caustic potassa, 100 glycerin, 600 water.

47. Hammersten's (indican). Shake urine well with chloroform, fuming muriatic acid, and solution of chlorinated lime. Blue coloration of chloroform.

48. Hehn's (essential oils; color reactions). Metachloral. Saturate alcohol with chlorine, distil off part of the muriatic acid, mix with sulphuric acid, and distil.

49. Heller's (glucose). Brown coloration on heating with caustic potassa.

50. Heinrich's (glucose). See *Sachsse*.

51. Herbst's (aconitin). Violet coloration on cautiously evaporating the solution with phosphoric acid.

52. Himmelmann's (arsenic; black spot). Marsh's method, substituting, however, granulated zinc, metallic iron, and a concentrated solution of ammonium chloride for zinc and diluted acid.

53. Hlasiwetz's (hydrocyanic acid). Blood-red coloration on heating an alkaline-cyanide solution with picric acid.

54. Hoffmann's (carbolic acid). Violet coloration with concentrated sulphuric acid and nitrate of potassium.

55. Hoffmann's (anilin). Fuming nitric acid. Deep-red coloration; turns yellow on slightly heating it, and finally red.

56. Hoppe-Seiler's (carbolic acid). Blue coloration of a pine

shaving moistened with muriatic acid. Tommasi substitutes for muriatic acid the following mixture: muriatic acid, 50 ccm.; water, 50 ccm.; chlorate of potassium, 0.2.

57. Horsley's (glucose). Green coloration on boiling with a solution of chromate of potassium containing free alkali.

58. Howie's (turmeric). 6 grains powdered rhubarb, or other powder, put on filtering-paper in a little heap, and drop on 50 drops chloroform. After drying put a piece of borax on the spot and a drop of muriatic acid.

59. Huber's (free mineral acids; red cloudiness). A mixture of solutions of molybdate of ammonium and ferrocyanide of potassium.

60. Huenefeld's (blood; dark-blue precipitate). French oil of turpentine, mixed with an equal bulk of alcohol and chloroform; add glacial acetic acid (one tenth of the bulk of turpentine), and drop to it water as long as the mixture remains clear. Use with equal bulk of tincture of guaiac (1:10).

61. Husemann's (morphine). Blue-violet or red coloration on heating with sulphuric acid and afterwards adding nitric acid.

62. Jacquemin's (anilin). Rose-red coloration on adding a little sulphydrate of ammonium; turns soon yellow.

63. Jacquemin's (carbolic acid). Blue coloration on addition of a little anilin, afterwards chlorinated soda.

64. Jorissen's (fusel-oil). Red coloration of the residue (after evaporating the ethereal solution) by anilin and muriatic acid.

65. Jorissen's (morphine). Red coloration (turning violet) on heating with diluted sulphuric acid and a small crystal of protosulphate of iron, and then pouring into ammonia. (The latter turns blue.)

66. Jungmann's (alkaloids). Blue coloration of the phosphomolybdates of certain alkaloids by ammonia.

67. Ittner's (hydrocyanic acid). Formation of Prussian blue in an alkaline-cyanide solution by a solution of a ferroso-ferric salt, acidulating with muriatic acid.

68. Kerner's (purity of quinine). See Wiegand's edition of Parrish or Dispensatories.

69. Kieffer's (morphine). Blue coloration (or precipitate) on adding ferric chloride and then (red) ferricyanide of potassium.

70. Knapp's glucose). 10 grms. cyanide of mercury in water, add 100 ccm. solution of caustic soda (1.145), and dilute to one litre. Reduction, 40 ccm. = 0.1 glucose.

71. Koehler's (alkaloids). See *Langley*.

72. Kolter's (hypochloric acid). Formation of brown oxychloride of mercury on shaking solution with metallic mercury.

73. Landolt s (carbolic acid). Crystalline-white precipitate on addition of bromine water in excess.

74. Langley's (alkaloids). Color reactions on adding nitrate of potassium and sulphuric acid, afterwards solution of caustic soda.—Koehler mixes the alkaloid with 3 to 5 times as much nitrate of potassium, adds 1 to 2 drops of sulphuric acid and solution of caustic soda.

75. Lassaigne's (hydrocyanic acid). White cloudiness (or precipitate) by sulphate of copper in presence of sulphurous acid.

76. Lassaigne's (nitrogenous bodies; formation of Prussian blue). Heating about 0.01 with a small piece of sodium in a dry test tube, then adding cautiously 2 to 3 ccm. water, then a solution of ferroso-ferric salt, and acidulate with muriatic acid.

77. Lehmann's (glucose; reduction). Solution in alcohol, add alcoholic solution of caustic potassa, then solution of sulphate of copper.

78. Lepage's (alkaloids). Potassio-cadmic iodide. White precipitate.

79. Letheby's (anilin). Blue coloration by sulphuric acid and peroxide of manganese at 50° C.

80. Lex's (carbolic acid). Blue coloration on adding ammonia and a little chlorinated-lime solution.

81. Lieben's (alcohol; formation of iodoform). Iodine and caustic potassa or soda.

82. Liebig's (purity of quinine). Ammonia and ether. White cloudiness.

83. Liebig's (hydrocyanic acid). Blood-red coloration on adding ferric chloride to the evaporation residue with a little sulphhydrate of ammonium.

84. Lindo's (alkaloids). Color reactions on dissolving in concentrated sulphuric acid in presence of solution of ferric chloride.

85. Lipp's (dextrin; white precipitate). A saturated solution of plumbic acetate heated to 60° C., and adding so much litharge that the mixture hardens, then extract with water, and filter.

86. Loewe's (glucose; reduction). A solution of 16 sulphate of copper in 64 water, mixed with 80 ccm. solution of caustic soda (1.34) and 6 to 8 glycerin.

87. Loewenthal's (glucose; brown precipitate on boiling). 60 tartaric acid, 240 carbonate of sodium, 5 crystalline ferric chloride, and 500 ccm. hot water.

88. Maisch's (turmeric in rhubarb, etc.). Borax and afterwards muriatic acid.

89. Maisch's (alcohol in essential oils). Potassium.

90. Mangini's (alkaloids; reddish-brown precipitate). Potassio-bismuthic iodide. 3 iodide of potassium, 16 iodide of bismuth, 3 muriatic acid. Produces no cloudiness with water.

91. Mann's (water in alcohol, air, etc.). 1 molybdic acid and 2 citric acid are rubbed together, fused, dissolved in water, filtered. Strips of paper are soaked with it and dried at 100° C. In presence of water this blue paper turns white.

92. Marmé's (alkaloids; white or yellowish precipitates). Potassio-cadmic iodide. Adding cadmium iodide to a boiling concentrated solution of potassium iodide till saturation, and then add an equal bulk of a cold saturated solution of potassium-iodide. Concentrated solutions keep, but not when diluted.

93. Marsh's (arsenic; black spots). Evolution of arseniuretted hydrogen. See Wiegand's edition of Parrish and Dispensatories.

94. Masset's (biliary matter). Color reaction on addition of 2 to 3 drops of sulphuric acid and a crystal of nitrate of potassium to urine.

95. Maumené's (glucose). Soak strips of white woollens in a 33⅓-per-cent solution of stannous chloride, and dry. If soaked in glucose solution and heated to 130° C., it turns brown to blackish brown.

96. Mayer's (alkaloids; white precipitates). Potassio-mercuric iodide. 13.546 bichloride of mercury and 49.8 potassium iodide dissolved in one litre water. Sometimes called Winckler's or Tanret's test.

97. Méhu's (albumen). Precipitate by a mixture of 1 carbolic acid, 1 acetic acid, 2 alcohol in presence of nitric acid or sulphate of sodium.

98. Merck's (opium). Treat with a solution of caustic potassa and shake with ether. A slip of filtering-paper dipped into it, moistened with muriatic acid and exposed to vapors of boiling water, turns red.

99. Millon's (albumen, urea; yellow, then red, coloration on

heating). 1 metallic mercury dissolved in 1 nitric acid (1.4), diluted with twice its bulk of water, and filtered after 24 hours.

100. Moore's (glucose). Turns brown on heating with caustic potassa, and evolves an odor of caramel on adding an acid in excess.

101. Mulder's (glucose). Turns the blue color of sulphindigotate of potassium into green and red on boiling.

102. Musculus's (urea). Putrescent urine is filtered, the filter washed, stained with turmeric, and dried. This paper turns brown by ammonium carbonate.

103. Nessler's (ammonium salts; yellow or reddish-brown coloration). Aqueous solution of 1 bichloride of mercury in 6 water mixed with a solution of 2¼ iodide of potassium in 6 water, and afterwards with a solution of 6 caustic potassa in 6 water, adding water up to 36 parts.

104. Otto's (morphine). Formation of Prussian blue by a mixture of muriatic acid, with solutions of ferric chloride and (red) ferricyanide of potassium.

105. Pagel's (phosphorous acid in phosphoric acid). Bichloride of mercury.

106. Pagenstecher's (hydrocyanic acid). See *Schoenbein*.

107. Panum's (albumen). Separation of albumen on boiling with a saturated solution of sodium sulphate.

108. Peligot's (glucose). Solubility of lime.

109. Pellagri's (morphine). Purple coloration on evaporating with muriatic and sulphuric acids.

110. Pellet's (glucose; reduction). 68.7 sulphate of copper, 200 chloride of sodium, 100 calcined carbonate of sodium, 6.87 chloride of ammonium dissolved in hot water, and diluted to one litre. 10 ccm. = 0.05 glucose.

111. Persoz's (textile fibres). Solution of oxychloride of zinc. 10 chloride of zinc in 10 water, and shaken several times with 2 oxide of zinc. Dissolves silk.

112. Pettenkofer's (biliary matter). Strong purple coloration on addition of cane-sugar and concentrated sulphuric acid. Drechsel substitutes phosphoric acid and heating for sulphuric acid.

113. Plugge's (carbolic acid). Mercurous nitrate with a trace of nitrous acid. Red color and reduction.

114. Poutet's (purity of olive-oil). 12 mercury, 15 nitric acid (1.35).

115. Pradines' (artificial color in wines). Saturated solution of gaseous ammonia in ether.

116. Puscher's (alcohol in essential oils). Dust a little fuchsin on the inside of a test-tube (the upper part), and drop the oil on to the bottom so as not to touch the sides. On heating, alcohol evaporates first and dissolves fuchsin.

117. Reinsch's (arsenic). Acidulate solution with muriatic acid and boil, having inserted a strip of bright copper. Bluish spots.

118. Richmont's (nitric acid). Red coloration (afterwards violet and brown) by protosulphate of iron and sulphuric acid.

119. Roth's (purity of olive-oil). Sulphuric acid (1.4) saturated with nitrous vapors.

120. Rump's (purity of quinine). Ether, ammonia. White cloudiness.

121. Runge's (anilin). Purple-violet coloration (turning rose-red by acids) on addition of a solution of chlorinated lime. Solution of muriate of anilin (even if very diluted) stains pine wood yellow.

122. Runge's (cane-sugar). Blackening on evaporating with diluted sulphuric acid.

123. Rust's (wood creasote from tar creasote). Ammonia, ferric chloride, and water.

124. Sachsse's (glucose; reduction). 18 iodide of mercury, 25 iodide of potassium in water, add 80 caustic potassa and water up to one litre. Heinrich employs only 10 caustic potassa in the above quantity. 40 ccm. = 0.1342 glucose.

125. Salkowski's (carbolic acid). Add one quarter of its volume ammonia and a few drops of solution of chlorinated lime (1:20). Blue or greenish color.

126. Scheibler's (alkaloids; precipitate). Phospho-tungstic acid. 100 tungstate of sodium and 60 to 80 phosphate of sodium dissolved in 500 ccm. water, acidulated with nitric acid.

127. Scherer's (inosit). An aqueous solution of inosit, evaporated nearly to dryness with nitric acid; to the residue is added ammonia and one drop solution of chloride of calcium: this evaporated turns rose-red.

128. Schiff's (cholesterin). Red coloration with concentrated sulphuric acid, afterwards adding ammonia.

129. Schiff's (urea). Purple coloration (finally brownish-black) on addition of furfurol and muriatic acid.

130. Schiff's (uric acid). A brown spot on filtering-paper impregnated with nitrate of silver. (The solution must be alkaline.)

131. Schlagdenhauffen's (alkaloids from glucosides, etc.). Equal parts of an alcoholic 3-per-cent solution of guaiacum and a saturated solution of bichloride of mercury. Only alkaloids give rise to a blue color.

132. Schlossberger's (textile fibres). A solution of freshly precipitated protoxide of nickel in ammonia. Dissolves silk.

133. Schmidt's (glucose). Red coloration on boiling with an ammoniacal solution of acetate of lead.

134. Schneider's (bismuth; blackish-brown precipitate on heating). A solution of 3 tartaric acid and 1 stannous chloride in sufficient solution of caustic potassa.

135. Schoenbein's (blood). Tincture of guaiac and oil of turpentine.

136. Schoenbein's (copper). Blue coloration on addition of cyanide of potassium and tincture of guaiacum.

137. Schoenbein's (peroxide of hydrogen). Blue coloration on addition of iodide of cadmium-starch paste, and a little protosulphate of iron.

138. Schoenbein and Pagenstecher's (hydrocyanic acid). Slips of filtering-paper, impregnated with a one-per-cent tincture of guaiacum, turn blue on being moistened with a one-tenth-per-cent solution of sulphate of copper.

139. Schultze's (alkaloids; white precipitate). Phospho-antimonic acid. A mixture of 4 of a saturated solution of phosphate of sodium with 1 chloride of antimony.

140. Schultze's (in vegetable histology, for isolation of parts). Nitric acid and a little chlorate of potassium.

141. Schulz's (salicylic acid). Green color on addition of solution of sulphate of copper to neutral solution of a salicylate.

142. Schulze's (cellulose). 25 dry chloride of zinc and 8 potassium iodide dissolved in 8½ water, adding as much iodine as it will dissolve.

143. Schwarzenberg's (alkaloids). Coloration on treating with nitric acid and ammonia.

144. Schweitzer's (textile fibres). A saturated solution of freshly precipitated hydrated oxide of copper in a 20-per-cent ammonia. Dissolves silk, cotton, linen.

145. Selmi's (alkaloids; color reactions). A saturated solution of iodic acid in concentrated sulphuric acid, diluted with six times its bulk of sulphuric acid.

146. Soldaini's (glucose; reduction). A solution of 15 carbonate of copper, mixed with a solution of 416 bicarbonate of potassium in 1400 ccm. water.

147. Sonnenschein's (alkaloids; color reactions). Ceroso-ceric oxide. Dissolve the alkaloid in concentrated sulphuric acid and add a trace of the test.

148. Sonnenschein's (alkaloids; yellow precipitate). Phosphomolybdic acid.

149. Stas's (alkaloids). See Wiegand's edition of Parrish or Dispensatories.

150. Tanret's (alkaloids). See *Mayer*.

151. Tattersal's (morphine). Dirty violet (afterwards sea-green) coloration on dissolving in concentrated sulphuric acid and adding a little arseniate of sodium.

152. Teichmann's (blood). 2 to 3 ccm. aqueous solution mixed with a few drops glacial acetic acid and about 0.01 chloride of sodium; a few drops are spread on a slide, let evaporate, and examined with the microscope. Haemin-crystals.

153. Thresh's (alkaloids; reddish-brown precipitate). Potassio-bismuthic iodide. 30 ccm. liquor bismuthi, Ph. Br.; 45 ccm. muriatic acid, 1.8 grams iodide of potassium.

154. Tommasi's (carbolic acid). See *Hoppe-Seiler*.

155. Trommer's (glucose; reduction). Add 1 to 2 drops solution of sulphate of copper, then 4 to 5 ccm. solution of carbonate of sodium. Compare also *Fehling*.

156. Trotarelli's (ptomaines; color reaction). Addition of sodium nitro-prusside and then palladium nitrate to the sulphate of ptomaines.

157. Violette's (glucose). See *Fehling*.

158. Vitali's (alkaloids; color reactions). Evaporate to dryness with fuming nitric acid, and add one drop of an alcoholic solution of caustic potassa.

159. Vogel's (glucose). Mulder's method (which see) substituting litmus for indigo.

160. De Vrij's (purity of quinine). 2 sulphate of chinoidin dissolved in 8 five-per-cent aqueous sulphuric acid, cautiously precipitated with iodine solution (= 1 iodine, 2 iodide of potassium, 100 water). The resinous precipitate washed, dried, dissolved in six times its weight of strong alcohol, filtered, evaporated, and again dissolved in five times its weight of alcohol.

161. Wiesners's (cellulose). Red or violet coloration on moistening paper or the microscopical section with a one-half-per cent phloro-glucin solution, afterwards treating with muriatic acid. A solution of sulphate of anilin (which colors yellow) is also called Wiesner's test.

162. Winckler's (alkaloids). See *Mayer*.

163. Yvon's (purity of chloroform). 1 permanganate of potassium, 10 caustic potassa, 250 water.

164. Zimmer's (purity of quinine). Ether, ammonia. See Wiegand's edition of Parrish, and the Dispensatories.

BY SUBJECTS.

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