

**PROCESS TECHNOLOGY-INORGANIC III**

101. Which of the following chemical company in USA is the largest producer of sulfuric acid
- (a) Rohm and Haas, (b) American Cyanamid,  
(c) Air Products, (d) Stauffer Chemical,
102. Sodium tripoly phosphate (STPP) is used as
- (a) a reinforcing agent in elastomers,  
(b) a raw material in the production of food – grade phosphoric acid,  
(c) a builder in detergents, (d) all of the foregoing,
103. Sodium triphosphate has a been used in USA as a detergent-builder since 1947, major functions are –
- (a) sequestering polyvalent metal ions,  
(b) preventing redeposition of dirt, controlling corrosion and deposits in the line of automatic washers  
(c) buffering the aqueous medium at pH between 9 and 10, killing some bacteria  
(d) all of the above
104. The use of sodium tripoly phosphate as a builder in detergents is disadvantageous from the point of view of –
- (a) carcinogenicity of the compound,  
(b) proneness to its decomposition at temp. above 30<sup>0</sup>C giving off noxious gases  
(c) eutrophication of lakes,  
(d) its excessively high cost,
105. Which of the following is an important reinforcing agent for various elastomers ?
- (a) sodium sulfate, (b) barium carbonate,  
(c) sodium sesquisilicate, (d) carbon black,
106. In the DCDA process of sulfuric acid manufacture the objective is to –
- (a) control environmental pollution due to emission of SO<sub>2</sub>/SO<sub>3</sub> gases,  
(b) increase the yield of sulfuric acid per unit quantity of sulfur consumed,  
(c) raise steam production; per unit mass of sulfuric acid produced,  
(d) make the plant more economic on scale,
107. Indicate which one of the following could be considered as disadvantage of the membrane cell process for caustic soda production. .
- (a) production of more effluent and use of costly membrane  
(b) inability to produce 48% caustic soda solution,  
(c) requirement of ultrapure brine, (d) all of the above
108. The most important process currently used for industrial production of carbon black is –

- (a) furnace black process, (b) channel black process,  
(c) lamp black process, (d) thermal black process,

109. Higher yield of carbon black is achieved starting with –

- (a) aliphatic hydrocarbon raw materials,  
(b) aromatic hydrocarbon raw materials,  
(c) carbon disulfide as raw materials,  
(d) chloro – fluoro hydrocarbons as raw materials,

110. The specific surface areas of carbon blacks used as reinforcing fillers in tire treads lie between –

- (a) 1 to 10 m<sup>2</sup>/gm. (b) 80 to 150 m<sup>2</sup>/gm,  
(c) 300 to 400 m<sup>2</sup>/gm, (d) 800 to 1000 m<sup>2</sup>/gm,

111. The ash content of most furnace blacks is –

- (a) less than 1 wt %, (b) around 10 wt %,  
(c) around 25 wt %, (d) none of the foregoing,

112. Which of the following varieties of silica gel is used for water adsorption at high humidities ?

- (a) regular-density gel having surface area of around 750-800 m<sup>2</sup>/g.  
(b) intermediate-density gel having surface area of around 300-350 m<sup>2</sup>/g.  
(c) low-density gel having surface area of around 100-200 m<sup>2</sup>/g.

113. Besides three basic elements of carbon, hydrogen and oxygen, which are common to all plants, there are sixteen other elements known to be essential for good plant growth. Of the sixteen elements, nitrogen, phosphorus and potassium are –

- (a) primary nutrients, (b) secondary nutrients,  
(d) micro nutrients,

114. Secondary nutrients in fertilizers are –

- (a) baron, copper, manganese, (b) calcium, molybdenum, zinc,  
(c) iron, sulfur, molybdenum, (d) calcium, magnesium, sulfur,

115. Which of the following are the micro-nutrients for plant ?

- (a) Boron, chlorine, copper, (b) iron, manganese, molybdenum, zinc,  
(c) cobalt, fluorine, iodine, (d) all of the foregoing,

116. Fertilizers containing all three primary nutrients are called mixed fertilizers whereas fertilizers containing only one active ingredient are called direct application fertilizers. The use of direct application fertilizer is increasing because –

- (a) ammonia gas is becoming popular,  
(b) ammonia gas can be directly pumped in 7.5 to 15 cm beneath the soil during ploughing,  
(c) ammonia gas is rapidly absorbed by the soil,  
(d) all of the foregoing,

117. Mixed fertilizer having its grade designated by, 5 – 25 – 10, means –

- (a) the fertilizer contains 5% by weight elemental nitrogen, 25% by weight  $P_2O_5$ , and 10% by weight  $K_2O$ .
- (b) the fertilizer contains 5% by weight ammonia, 25% by weight phosphoric acid, and 10% by weight potassium chloride,
- (c) the fertilizer contains 5% by weight  $K_2O$ , 25% by weight  $NH_3$ , and 10% by weight  $P_2O_5$ .
- (d) the fertilizer contains 5% by weight  $P_2O_5$ , 25% by weight  $NH_4Cl$ , and 10% by weight  $K_2O$ .

118. Ammonia, urea, ammonium nitrate and ammonium sulfate are used as sources of nitrogen in mixed fertilizers. A nitrogen solution having code number 392 (20 – 63 – 5) means the fertilizer contains –

- (a) 39.2% ammonia, 20% urea, 63% ammonium nitrate and 5% ammonium sulfate,
- (b) 39.2% total nitrogen, 20% free ammonia, 63% ammonium nitrate and 5% urea with the rest being water,
- (c) 39.2% total nitrogen, 20% urea, 63% ammonium nitrate and 5% ammonium sulfate with the rest being water,
- (d) 39.2% total nitrogen, 20% ammonium nitrate, 63% free ammonia and 5% urea with the rest being water,

[ Note: More than 100 varieties of nitrogen solutions are marketed in USA as fertilizers ]

119. Mixed solid fertilizers can be made by –

- (a) direct granulation,
- (b) bulk blending,
- (c) both (a) and (b),
- (d) neither (a) nor (b); solutions of different fertilizers are mixed together and the solution so obtained is cooled to crystallize out the mixed solid fertilizer which is subsequently dried and marketed.

120. Between 1950 and 1980 world wide fertilizer consumption increased by a factor of around –

- (a) four,
- (b) six,
- (c) eight,
- (d) sixteen,

121. In 1980 the world consumption of fertilizers was approximately –

- (a) 27 million tons,
- (b) 56 million tons,
- (c) 81 million tons,
- (d) 114 million tons,

122. Basic steps in the urea manufacturing process are –

- (a)  $NH_3$  and  $CO_2$  are reacted at high temperature and pressure to form ammonium carbonate,
- (b) The carbonate is then dehydrated to urea and water,

One of these two steps is exothermic and the other is endothermic. Which one is the exothermic step?

123. In the urea manufacturing process, feed to the urea reactor consists of  $\text{NH}_3$  and  $\text{CO}_2$  in the under ratio of –

- (a) 1 : 3-4, (b) 1 : 1,  
(c) 3 – 3.5 : 1 (d) none of the foregoing,

124. Temperature and pressure in the urea reactor are of the order of –

- (a) 50 – 70°C, 1000 bar, (b) 110–140°C, 300 bar,  
(c) 30 – 60°C, 700 bar, (b) 180–210°C, 150 bar,

101d, 102c, 103d, 104c, 105d, 106a, 107d, 108a, 109b, 110b, 111a,  
112b, 113a, 114d, 115d, 116d, 117a, 118b, 119c, 120c, 121d, 122a,  
123c, 124d

❖ For Further details, corrections and information. You may contact at:

**The Gate Coach**  
[www.thegatecoach.com](http://www.thegatecoach.com)  
[delhi.tgc@gmail.com](mailto:delhi.tgc@gmail.com)  
**(+91) 9818652587 , 9873452122**

