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AG—44—2018

FACULTY OF SCIENCE

M.Sc. (Second Year) (IV Semester) EXAMINATION

NOVEMBER/DECEMBER, 2018

(CBCS Course)

INORGANIC CHEMISTRY

(Organometallic Catalysis and Fluxanality)

Paper-XVII (CH-541/1)

(Tuesday, 27-11-2018)

Time : 2.00 p.m. to 5.00 p.m.

Time—3 Hours

Maximum Marks—75

N.B. :—All questions are compulsory.

1. Solve any *three* out of five : 15

- (a) Classify the catalyst on the basis of phase. Give examples.
- (b) What is Fluxionality ? Give suitable examples.
- (c) Explain the mechanism of Suzuki coupling reaction.
- (d) Write reaction which involves use of lithium aluminum hydride.
- (e) Discuss the effect of pH and particle size on the catalytic effect.

2. Solve any *three* out of five : 15

- (a) Write detailed mechanism of Wacker's process.
- (b) Describe method of preparing commercial zeolite.
- (c) Enlist various physical properties of catalyst.
- (d) What is desorption ? Give the example.
- (e) Explain the role of catalyst in hydrogenation of edible oil.

3. Answer the following :

(a) Discuss the use of Reppe's catalyst with suitable examples. 8

Or

Discuss the principle of hydrogenation of alkenes.

(b) Explain the mechanism of hydrosilation with examples. 7

Or

Draw Tolmen catalytic cycle and explain salient features of it.

P.T.O.

4. Answer the following :

(a) Describe the method to determine rate of fluxionality. 8

Or

What is the importance of sodium borohydride in chemical industries ?

(b) Describe the role of catalyst in Monsanto process. 7

Or

Draw structure of Wilkinson's catalyst and write its commercial importance.

5. (A) Select the correct alternative from the following : 5

(1) Zeolites are microporous mineral.

(a) Aluminium silicate

(b) Copper pyrite

(c) Pyrolusite

(d) Illmenite

(2) Homogeneous organometallic catalyst, which catalyzes the hydrogenation of olefins.

(a) Ru(II) Cl

(b) Ferrocene

(c) OsO₄

(d) RhCl(PPh₃)₃,

(3) The reductive polymerization of CO to form straight chain hydrocarbons, olefins and alcohols is known as

(a) Heck's Reaction

(b) Fischer-Tropsch Reactions

(c) Clemmenson's Reaction

(d) Friedel-Crafts' Reaction

- (4) Molecules that undergo dynamics such that some or all of their atoms interchange between symmetry-equivalent positions are known as
- (a) Fluxional molecules
 - (b) Rigid Molecule
 - (c) Non-rigid molecule
 - (d) Dynamic molecule
- (5) Hydroformylation, there action of an olefin with CO and H₂ in the presence of a metal carbonyl to form
- (a) Aldehyde
 - (b) Alcohol
 - (c) Ester
 - (d) Acid
- (B) Write brief notes on (any two) :
- (a) Surface area and catalysis
 - (b) Organometalic compound as catalyst
 - (c) Ziegler Natta catalyst.

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