



# UNIVERSITY OF THE PUNJAB

Seventh Semester 2017

Examination: B.S. 4 Years Programme

Roll No. ....

**PAPER: Inorganic Chemistry (Sp. Theory-II)**  
**Course Code: CHEM-407**

**TIME ALLOWED: 2 hrs. & 30 mins.**  
**MAX. MARKS: 50**

*Attempt this Paper on Separate Answer Sheet provided.*

## Q. No. 2: Short Questions

(2x 10=20)

Answer the following:

- (i) What are the precautionary measures to use liq. HF as solvent?
- (ii) How molten salt systems can be classified? Give examples.
- (iii) What is Saddy-Fajans and Russel group displacement law?
- (iv) What are spinels?
- (v) Explain any one artificial radioactive series.
- (vi) Discuss the role of two metal oxides as superconductors?
- (vii) Give examples of such molten salt systems that can be used at room temperature.
- (viii) What is the difference between isobars and isotones?
- (ix) What are projectile accelerators? Give example.
- (x) What are the limitations of using water as solvent?

UA

## Q. No. 3: Long Questions

(5 x 6=30)

Answer the following:

- (i) Define electromotive force. How electrode potential is measured?
- (ii) Discuss the chemistry of metals in liquid ammonia?
- (iii) Describe redox and complexation occurring in liq. HF.
- (iv) Discuss the role of metal oxides as high temperature superconductors.
- (v) How reactions in molten salt systems can be investigated?
- (vi) How the radioactivity of a sample can be measured? Explain any one method.







# UNIVERSITY OF THE PUNJAB

Seventh Semester 2018

Examination: B.S. 4 Years Programme

Roll No. ....

**PAPER: Inorganic Chemistry (Sp. Theory-II)**  
**Course Code: CHEM-407**

**TIME ALLOWED: 2 hrs. & 30 mins.**  
**MAX. MARKS: 50**

*Attempt this Paper on Separate Answer Sheet provided.*

## Short Questions

**Q. 2 Write down short answers for the following questions: (2 x 10=20)**

- (i) How the radioactivity can be measured by Geiger Muller Counter?
- (ii) Define electromotive force. How electrode potential is measured?
- (iii) Give examples of molten salt system that can be used at room temperature.
- (iv) What are the precautionary measures to use Liq.  $\text{SO}_2$  as solvent?
- (v) Describe the role of metal oxides as high temperature super conductors.
- (vi) Give the classification of solvents on the basis of polarity.
- (vii) Discuss the chemistry of complex formation reactions occurring in liq.  $\text{BrF}_3$ .
- (viii) What are the limitations of using water as solvent?
- (ix) What is relationship between decay constant and half life of radioactive compound?
- (x) What is the role of artificial transmutation reactions in daily life?

UA

## Long Questions

**Q. 3 Answer the following: (6x 5=30)**

- (i) How reaction occurring in molten salts can be monitored?
- (ii) Discuss the chemistry of acid base and complex formation reactions occurring in liq.  $\text{NH}_3$ .
- (iii) What are projectile accelerators? Give examples.
- (iv) What is group displacement law?
- (v) What are the hazardous effects of volatile oxides on environment?







# UNIVERSITY OF THE PUNJAB

Seventh Semester – 2019

Examination: B.S. 4 Years Program

Roll No. ....

**PAPER: Inorganic Chemistry (Sp. Theory-II)**

**Course Code: CHEM-407 Part – II**

**MAX. TIME: 2 Hrs. 45 Min.**

**MAX. MARKS: 50**

**ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED**

**Q.2. Give short answers to the following questions.**

**(10x2=20)**

- (i) Give examples of molten salts system that can be used at room temperature.
- (ii) What is the relationship between decay constant and half life of radioactive compound.
- (iii) What is rule of artificial transmutation in daily life?
- (iv) Why  $\text{SO}_3$  and  $\text{SiO}_2$  tend to form polymers.
- (v) Give advantages and disadvantages of using liquid ammonia as solvent.
- (vi) What is levelling effect of solvents?
- (vii) Give examples of complex formation reactions in  $\text{BrF}_3$ .
- (viii) What do you mean by spinals? Discuss their magnetic properties.
- (ix) Give applications of artificial transmutation reactions.
- (x) What are environmental issues caused by oxides of nitrogen.

UA

**Q.3. Give brief answers to the following questions.**

**(3x10=30)**

- (i) Discuss the chemistry of acid-base and complex formation reactions occurring in liquid ammonia.
- (ii) What do you mean by projectile motion? How they can be accelerated?
- (iii) How reactions in molten salts can be monitored?





**ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED**

**Q.2. Give short answers of the following:**

**(10x2=20)**

- (i) Give examples of molten salts system that can be used at room temperature.
- (ii) Differentiate between natural and artificial radioactivity.
- (iii) Derive a relationship between activity and number of half-lives for a radioactive substance?  
UA
- (iv) Discuss uses of MgO and TiO<sub>2</sub> in industry.
- (v) Give brief description of detection of radioactivity by Geiger-Muller counter.
- (vi) What do you mean by spinals? Discuss their magnetic properties.
- (vii) What are environmental issues caused by oxides of sulfur?
- (viii) Give example of neutralization reaction in HF.
- (ix) Prove that angular momentum remains constant when a beta particle is emitted from nucleus.
- (x) Discuss complex formation reactions occurring in liquid ammonia.

**Q.3. Answers the following questions.**

**(3x10=30)**

UA

- (i) Describe the role of metal oxides as high temperature super conductors.
- (ii) What is Soddy-Fajan's group displacement law?
- (iii) How reactions in molten salts can be monitored?







**Q.1. Answer the following short questions:**

**(15x2=30)**

- (i) What is meant self-ionization of solvent? Explain your answer with two examples.
- (ii) What is dielectric constant? What is its effect on solubility?
- (iii) Write equations to show what happens when each of the following dissolves in liquid HF:  
(a)  $\text{BrF}_3$                       (b)  $\text{EtOH}$
- (iv) What are the benefits of metal in liquid  $\text{NH}_3$  solution?
- (v) Addition of potassium to  $\text{H}_2\text{O}$  results in a vigorous reaction; addition of potassium to liquid  $\text{NH}_3$  gives a bright blue solution, which over a period of time liberates  $\text{H}_2$ , why?
- (vi) How the natural radioactive series is differentiated from the artificial radioactive series?
- (vii) Give the relation between activity and number of half-lives in radioactive disintegration.
- (viii) Give examples of metal oxides that can be used as high temperature conductors.
- (ix) What is the role of radioisotopes in medicines?
- (x) Give at least four hazardous effects of oxides.
- (xi) Give a brief note on magnetic properties of mixed metal oxide.
- (xii) Explain briefly  $\text{AB}_2\text{O}_4$  type spinels.
- (xiii) What is meant by Inverse spinels?
- (xiv) Differentiate between protic and aprotic solvents.
- (xv) Differentiate between ferromagnetic substances and diamagnetic substances.

**Q.2. Answer the following questions.**

**(5x6=30)**

- (a) How radioactivity is monitored by Geiger Muller counter and Wilson cloud Chamber?
- (b) Write a note on types of artificial transmutation reactions induced by different projectile.
- (c) What are perovskites? Draw their structures also.
- (d) Explain complexometric reactions and redox reactions in liquid ammonia.
- (e) Explain the role of  $\text{Liq SO}_2$  as solvent in organic synthesis.





THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions:

(15x2=30)

- (i) What are the hazardous effects of non metal oxides?
- (ii) Differentiate between Low temperature superconductors and high temperature superconductors.
- (iii) How radioactivity can be detected in any system?
- (iv) What is Paramagnetism? And explain its cause.
- (v) Give at least one example in which metal oxides are used as photo-catalyst.
- (vi) What is activity? How it is related with half-life?
- (vii) Differentiate between Nuclear Fission and Nuclear Fusion reactions.
- (viii) What is meant by Radioactive equilibrium?
- (ix) What are Spinel?
- (x) Briefly explain the major classification of solvents.
- (xi) How reactions in molten salts can be studied?
- (xii) Write down the role of  $\text{BrF}_3$  for oxygen determination in metal oxides
- (xiii) Briefly discuss the advantages of using liquid ammonia as solvent.
- (xiv) Give at Least two reactions in Liquid  $\text{SO}_2$  for the complex formation.
- (xv) Explain the units to measure Radioactivity.

UA

Q.2. Answer the following questions.

(3x10=30)

- (a) Write down Acid Base, redox, precipitation, and complex formation reactions in Liquid  $\text{NH}_3$
- (b) What are applications of radio-isotopes in industry and chemistry?
- (c) What are the limitations of water and Liquid  $\text{HF}$  to be used as Solvents. Give some reactions occurring in Liq  $\text{HF}$ .





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Seventh Semester – Fall 2023

Paper: Inorganic Chemistry (Sp. Theory-II)

Course Code: CHEM-407

Roll No.

41611

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

(15x2=30)

**Q.1. Answer the following short questions:**

- (i) Explain briefly  $AB_2O_4$  type spinels.
- (ii) What is meant by Inverse spinels?
- (iii) Differentiate between protic and aprotic solvents.
- (iv) Differentiate between ferromagnetic substances and ferroelectric substances.
- (v) What is meant self-ionization of solvent? Explain your answer with two examples.
- (vi) What are the limitations to use  $\text{Liq. NH}_3$  as solvent?
- (vii) Give some examples of molten salt that can be used at room temperature as solvent?
- (viii) Write equations to show what happens when each of the following dissolves in liquid HF:  
(a)  $\text{BrF}_3$                       (b)  $\text{EtOH}$
- (ix) What are the benefits of metal in liquid  $\text{NH}_3$  solution?
- (x) Addition of sodium to water results in a vigorous reaction; addition of sodium to liquid  $\text{NH}_3$  gives a bright blue solution that slowly liberates  $\text{H}_2$ , why?
- (xi) How the natural radioactive series is differentiated from the artificial radioactive series?
- (xii) Give the relation between activity and number of half-lives in radioactive disintegration.
- (xiii) Which metal oxides can be used as high temperature conductors.
- (xiv) What is the role of radioisotopes in chemistry?
- (xv) Give at least four harmful effects of effects of oxides.

(3x10=30)

**Q.2. Answer the following questions.**

- (a) Write a note on types of artificial transmutation reactions induced by different projectile.
- (b) Explain the chemical reactions that can be carried out in  $\text{Liq. BrF}_3$ .
- (c) Describe the chemistry of Spinels and Perovskites.