

**CHEMISTRY TEST  
FOR MIDDLE SEMESTER II**

School : SMA NEGERI 5 MALANG  
Subject : CHEMISTRY  
Class / program : X / SBI  
Day / date : Saturday, April 17<sup>th</sup> 2010  
Time allocation : 10.00 am – 11.30 am (90 minutes)

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Read the following instructions carefully!

1. Use 2B pencil to do the test on computerized answer sheet. You may also use a pencil for any diagrams, Write down your name, class, and test number on the space provided in the answer sheet.
2. graph or rough working.
3. Blacken the correct answer on computerized answer sheet.
4. To fix the answer already blacken on computerized answer sheet, erase it clearly and blacken your correct answer.
5. Any rough working should be done in this booklet.
6. You are not allowed to use dictionary (book/electronic), nor correction fluid

**I. Choose the true answer !**

1. Which of the following elements is most difficult to remove an electron?  
a.  ${}_3\text{Li}$                       c.  ${}_4\text{Be}$                       e.  ${}_{11}\text{Na}$   
b.  ${}_9\text{F}$                               d.  ${}_7\text{N}$
2. Which of the following groups is arranged correctly in order of increasing atomic radius?  
(atomic number of Li=3, Be=4, N=7, F=9)  
a.  $\text{F} < \text{N} > \text{Be} < \text{Li}$               c.  $\text{N} < \text{F} > \text{Be} < \text{Li}$               e.  $\text{N} < \text{F} < \text{Li} < \text{Be}$   
b.  $\text{F} < \text{N} < \text{Be} < \text{Li}$               d.  $\text{F} < \text{Be} < \text{N} < \text{Li}$
3. The true size of atoms and ions is .....  
a.  $\text{Be} < \text{Be}^+ < \text{Be}^{2+}$               c.  $\text{Mg}^{2+} > \text{Mg}^+ > \text{Mg}$               e.  $\text{Mg}^{2+} < \text{Mg}^+ > \text{Mg}$   
b.  $\text{Be} < \text{Be}^+ > \text{Be}^{2+}$               d.  $\text{Mg}^{2+} < \text{Mg}^+ < \text{Mg}$
4. If the atomic number of Al is 13, so the effective nuclear charge ( $Z_{\text{eff}}$ ) this atom is .....  
a. +2                                      c. Close to +3                      e. Close to +4  
b. Close to +2                      d. +3
5. The elements within alkali metals group have similar structure. Which one of the following atom has the highest melting point?  
a.  ${}_{11}\text{Na}$                       c.  ${}_{55}\text{Cs}$                       e.  ${}_{19}\text{K}$   
b.  ${}_3\text{Li}$                               d.  ${}_{37}\text{Rb}$
6. Which of the following groups is arranged correctly in order of decreasing ionization energy?  
(atomic number of Li=3, C=6, Ne=10, Si=14)  
a.  $\text{Ne} > \text{Li} > \text{Si} > \text{C}$               c.  $\text{Ne} > \text{C} > \text{Si} > \text{Li}$               e.  $\text{Ne} < \text{C} < \text{Si} < \text{Li}$   
b.  $\text{Li} > \text{C} > \text{Si} > \text{Ne}$               d.  $\text{Li} < \text{Si} < \text{C} > \text{Ne}$
7. Compare the five elements  ${}_5\text{B}$ ,  ${}_6\text{C}$ ,  ${}_{13}\text{Al}$ ,  ${}_{14}\text{Si}$ ,  ${}_{15}\text{P}$ .  
Which has the most positive electron affinity?  
a. B                                      c. Si                                      e. P  
b. C                                      d. Al

8. The highest first ionization energy is belong to ...
- F
  - Mg
  - C
  - Al
  - N
9. Which one of these elements needs lowest energy to remove its electron?
- F
  - Mg
  - C
  - Al
  - N
10. If halogen elements (X) react with hydrogen, the compound formula that might be form is ...
- H<sub>2</sub>X
  - HX
  - HX<sub>2</sub>
  - XH
  - X<sub>2</sub>H

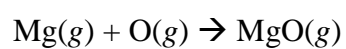
11. Which of the Lewis Structure of K<sub>2</sub>O are correctly drawn?

- |   |   |
|---|---|
| a. $[\text{K}]^+ [:\ddot{\text{O}}:]^{2-}$  | d. $2[\text{K}]^+ [:\ddot{\text{O}}:]^-$    |
| b. $2[\text{K}]^+ [:\ddot{\text{O}}:]^-$    | e. $2[\text{K}]^+ [:\ddot{\text{O}}:]^{2-}$ |
| c. $2[\text{K}]^+ [:\ddot{\text{O}}:]^{2-}$ |   |

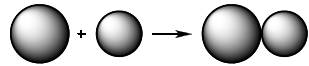
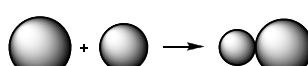
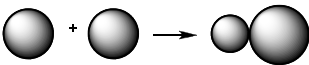
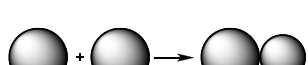
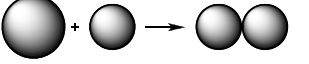
12. Which one of the following compound consists of simple cation and polyatomic anion?

- AlF<sub>3</sub>
- KClO<sub>4</sub>
- Mg<sub>3</sub>N<sub>2</sub>
- NH<sub>4</sub>Br
- NH<sub>4</sub>NO<sub>3</sub>

13. If one magnesium atom reacts with one oxygen atom as shown below:



Which of the following figure represents the size of species involved in this reaction?

- |  |  |
|--|--|
| a.  | d.  |
| b.  | e.  |
| c.  |  |

14. The unit cell of CsCl crystal is *primitive cubic*. How many coordination numbers of each anion and each cation are in this crystal?

- |                            |                            |
|----------------------------|----------------------------|
| a. Anion = 4<br>Cation = 4 | d. Anion = 4<br>Cation = 6 |
| b. Anion = 6<br>Cation = 6 | e. Anion = 8<br>Cation = 8 |
| c. Anion = 6<br>Cation = 8 |                            |

15. What is the charge of sodium ion with 11 protons and 10 electrons?

- 2

- b. -1
- c. 0
- d. +1
- e. +2

16. Given properties such as:

- (1) Have high melting point
  - (2) Usually belongs to malleable material
  - (3) Can conduct electricity in molten state
  - (4) Can't conduct electricity when solved in water
- Which of the following option refers to properties of KCl?

- a. 1, 2, and 3
- b. 1 and 3
- c. 2 and 4
- d. 4
- e. 1, 2, 3, and 4

17. Which of the following answer are correctly ordered based on decreasing melting point?

- a. NaF, NaCl, NaBr, NaI
- b. NaF, NaBr, NaCl, NaI
- c. NaI, NaCl, NaBr, NaF
- d. NaI, NaBr, NaCl, NaF
- e. NaCl, NaBr, NaI, NaF

18. What is the correct formula for magnesium oxide?

- a. MgO
- b. MgO<sub>2</sub>
- c. Mg<sub>2</sub>O<sub>2</sub>
- d. Mg<sub>2</sub>O
- e. Mg<sub>2</sub>O<sub>3</sub>

19. Which of the following species belongs to ionic compound?

- a. CO<sub>2</sub>
- b. H<sub>2</sub>O
- c. K<sub>2</sub>O
- d. N<sub>2</sub>O
- e. H<sub>2</sub>S

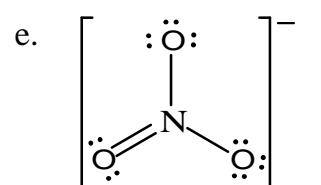
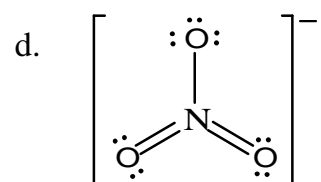
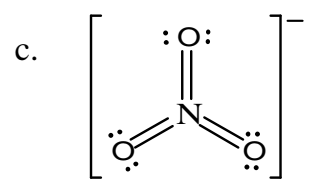
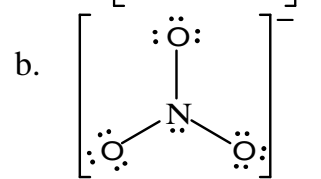
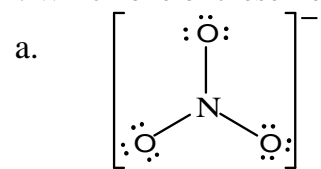
20. Mg atom has 12 electrons in its shells. Which electrons of Mg atom may be participated in chemical bonding formation according to Lewis?

- a. The electrons in K shell
- b. The electrons in K and L shell
- c. The electrons in K, L, and M shell
- d. The electrons in L and M shell
- e. The electrons in M shell

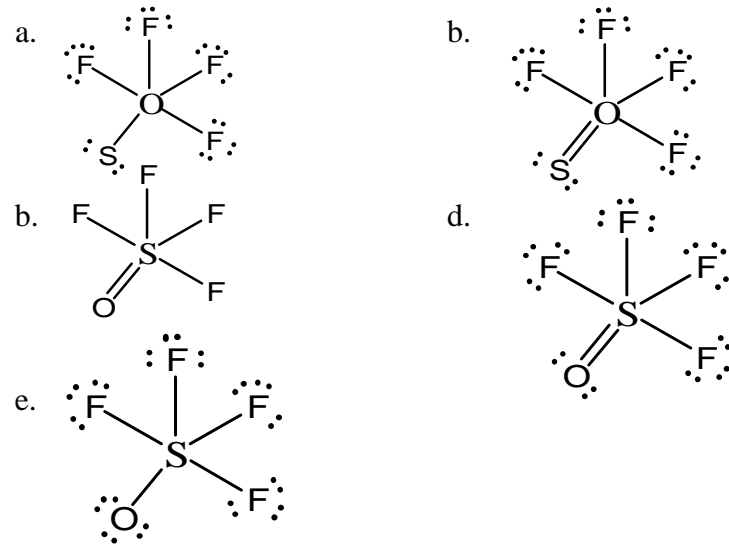
21. Which of the Lewis symbol of an ion is correctly drawn in stable state ?

- a.  $[\ddot{\text{O}}:]^-$
- b.  $[\cdot\text{Mg}\cdot]^{2+}$
- c.  $[\text{Mg}]^{2+}$
- d.  $[\ddot{\text{O}}:]^{2-}$
- e.  $[\text{Mg}]^+$

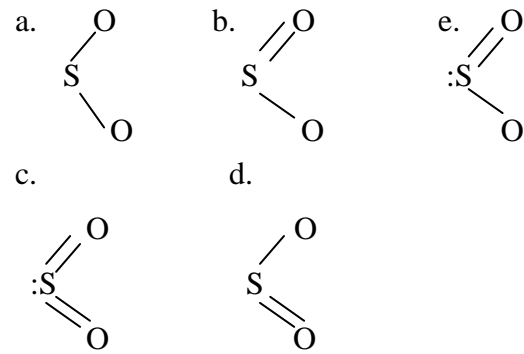
22. Which one of these Lewis structure is correct?



23. Struktur Lewis yang benar untuk molekul OSF<sub>4</sub> adalah ...



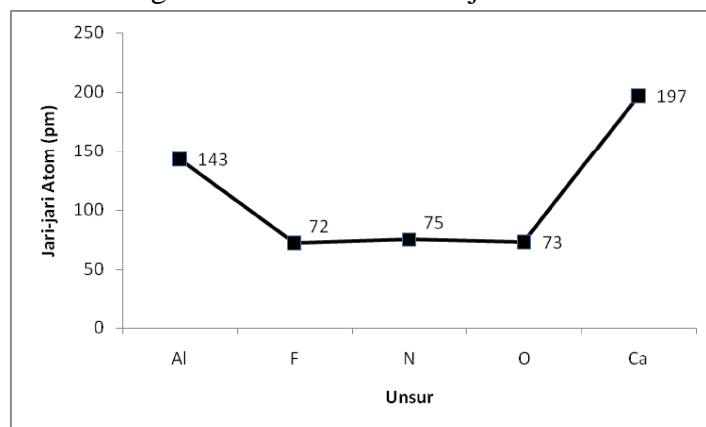
24. Struktur Lewis SO<sub>2</sub> yang paling stabil terdapat pada?



25. Dalam satu periode yang sama bila dibandingkan dengan unsur golongan alkali, maka unsur alkali tanah mempunyai sifat.....

- Energi ionisasi lebih besar
- Afinitas elektron lebih kecil
- Jari-jari atom lebih besar
- Keelektronegatifan lebih kecil
- Lebih reaktif

Perhatikan grafik berikut untuk menjawab soal nomor 26-27:



26. Energi ionisasi pertama tertinggi dimiliki oleh ...

- Al
- F
- N
- O
- Ca

27. Pada saat menangkap elektron pertama, energi paling kecil dilepaskan oleh ...

- Al
- F

- c. N  
d. O
- e. Ca
28. Elektronegativitas atau keelektronegatifan suatu atom adalah sifat yang menyatakan...
- Besarnya energi yang dilepaskan apabila atom menangkap sebuah elektron dan menjadi ion negatif.
  - Besarnya kemampuan untuk menarik elektron dalam pembentukan ion positif.
  - Besarnya energi yang terlibat pada penangkapan elektron oleh atom atau ion
  - Besarnya kecenderungan atom atau ion untuk melepaskan sebuah elektron dalam pembentukan ion positif
  - Besarnya kemampuan relatif atom untuk menarik elektron kearah dirinya sendiri dalam ikatan kimia
29. Data keelektronegatifan atom menurut skala pauling:
- Sr : 0,95  
Br : 2,96  
As : 2,18  
S : 2,58  
Si : 1,90
- Atom yang mempunyai sifat kelogaman terendah adalah ...
- Sr
  - Br
  - As
  - S
  - Si
30. Unsur X mempunyai konfigurasi elektron : 2 8 8 2, sedangkan unsur Y: 2 8 18 7. Kalau kedua unsur membentuk senyawa, maka rumusnya adalah ...
- $XY_2$
  - $X_2Y$
  - $X_2Y_3$
  - $X_2Y_5$
  - $X_2Y_7$
31. Magnesium melepaskan 2 elektron untuk membentuk senyawa ionik dengan oksigen. Berapa muatan dari ion magnesium?
- 2
  - 0
  - +2
  - +1
  - 1
32. NaCl terdiri dari kation dan anion. Manakah yang menggambarkan simbol lewis anionnya?
- $[\text{Na}]^+$
  - $[\text{Na}\cdot]^+$
  - $[\cdot\ddot{\text{Cl}}\cdot]^-$
  - $[\cdot\ddot{\text{Cl}}:]^-$
  - $[\text{Na}]^+ [\cdot\ddot{\text{Cl}}:]^-$
33. Manakah di bawah ini yang merupakan anion poliatomic?
- $\text{NH}_4^+$
  - $\text{NH}_3$
  - $\text{N}^{3-}$
  - $\text{IO}_3^-$
  - $\text{Br}^-$
34. Rumus senyawa ionik yang terdiri dari kalsium dan oksigen adalah....
- $\text{Ca}_2\text{O}$
  - $\text{CaO}_2$
  - $\text{Ca}_2\text{O}_2$
  - $\text{CaO}$
  - $\text{Ca}^+\text{O}^-$

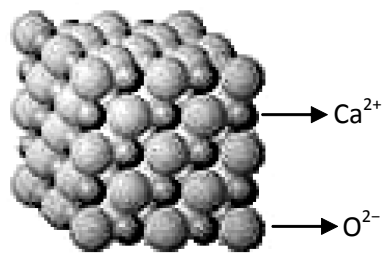
35. Beberapa senyawa berikut:

- i.  $\text{CCl}_4$                       iii.  $\text{NH}_3$
- ii.  $\text{SiO}_2$                       iv.  $\text{KCl}$

dari senyawa di atas yang merupakan senyawa ionik adalah...

- a. i, ii, iii                      c. ii, iv                      e. i, ii, iii, iv
- b. i, iii                      d. iv saja

36. Diketahui struktur kristal  $\text{CaO}$  sebagai berikut:



Bilangan koordinasi dari  $\text{Ca}^{2+}$  adalah ...

- a. 8                      d. 3
- b. 6                      e. 2
- c. 4

37. Atom N mempunyai nomor atom 7. Berapa banyak elektron yang digambarkan pada simbol lewis atom N?

- a. 1                      d. 5
- b. 2                      e. 7
- c. 3

38. Ikatan yang terjadi melalui serah terima elektron antara atom yang satu dengan atom yang lain disebut...

- a. Ikatan hidrogen                      d. Ikatan kovalen
- b. Ikatan logam                      e. Ikatan kovalen koordinasi
- c. Ikatan ionik

39. Ikatan kovalen koordinasi terdapat pada.....

- a.  $\text{H}_2\text{O}$                       d.  $\text{HF}$
- b.  $\text{NH}_4^+$                       e.  $\text{C}_2\text{H}_4$
- c.  $\text{CH}_4$

40. Pada molekul  $\text{N}_2$ , jumlah pasangan elektron yang digunakan untuk berikatan ada ...

- a. 1
- b. 2
- c. 3
- d. 4
- e. 5