الاجـــابـــــات

قسم : الفيزياء **المادة : فيزياء الفلزات و السبائك**

الفرقة :الثانية فيزياءالزمن : 3ساعة

تاريخ الامتحان : 2012/6/3 **استاذ المادة : د / محمود حسنى موسى مقلد**

اجب عن 5 اسالة فقط

السؤال الأول :

a- In unary system the boundary between two phases is a thin line, but in binary is a lens shape region, explain

ANS:

The binary system consists of two materials, each one different in the thermal behavior then the other , for that , every materials need special temperature to change from phase to phase

b-Short rang crystalline system can be found in

a) Solid b) polymer c) a&b d) no a&b

ANS: *C*

السؤال الثانى :

a- define, tie line, composite materials, elasticlimit,the penetration depth of diffusion, Eutectic point

ANS:

Tie line, a line parallel to composition axis inside the lens region in binary system , used in determination of the composition of each phases

Composite materials, the material composed of polymer and filler

Elastic limit, is the maximum elongation of the martial

The penetration depth of diffusion, the depth to which diffusion is significant

Eutectic point, it found in binary system, when the material the liquid transfers directly to the solid

b- What are the two opposite systems in Bravais Lattice?

ANS:

Cubic and Triclinic

السؤالالثالث

a- Compare between Substitutional and interstatitial solid solution.

ANS:

	Substitutional	interstatitial
1	Solute atoms replaced solvent	Solute atoms dose not replaced solvent
2	It may be ordered or disordered	One type
3	It depends of 4 rules	Normally , less than 1 A° radii atoms form it

b- The boiling point depends on

A) Temperature b) pressure C) a & b

ANS: C

السؤالالرابع

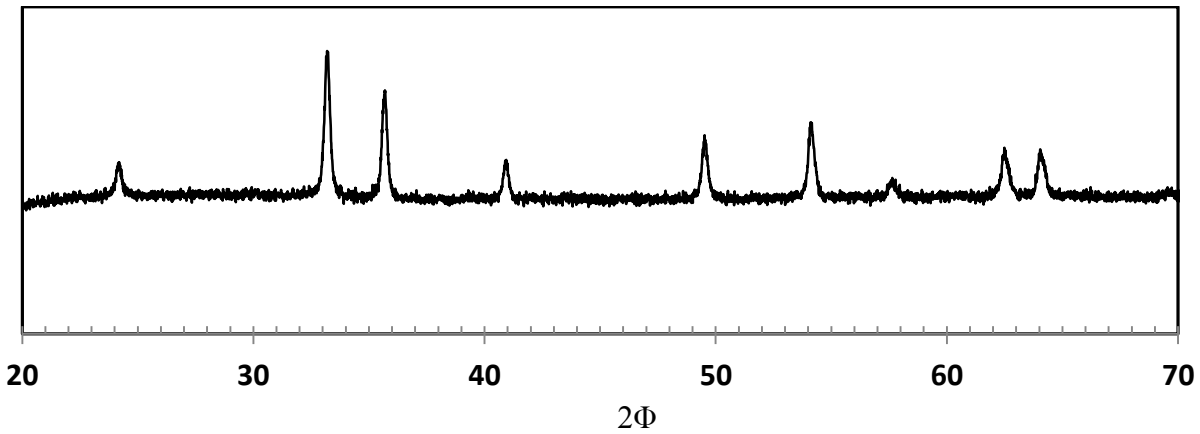
The numbers of defects in crystal given by$n_d = Nexp(-\frac{\Delta H}{KT})$, where N is the number of sites , ΔH is the enthalpy , K is the Boltzmann constant and T temperature , rewrite this formula in the case of Schottky defect , with discussion

ANS:

one Schottky defect consists of one cation vacancy plus one anion vacancy , so the number of schottky defects in a crystal is equal to one half of the total number of vacancies , for that ,

$n_d = Nexp(-\frac{\Delta H}{KT})$will be $n_d = Nexp(-\frac{\Delta H}{2KT})$

السؤالالخامس

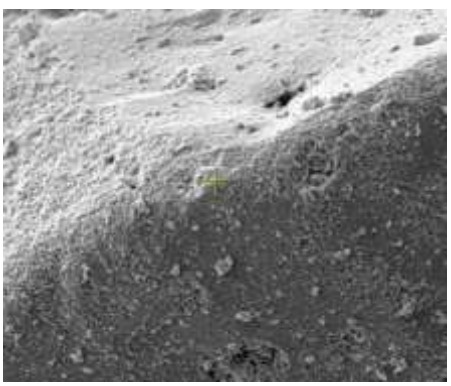


a- Calculate the particles size for the present X-Ray Chart , λ= 5.43nm

ANS:

- by using Brrage,s Low nλ = 2d sinθ , n=1 firist order diffraction , λ = 5.43 nm , and the diffraction angle θ can be taken from the X- Ray chart at the peaks position , one can be estimate d

A



b

b- By each Microscopes you can expected these photos have been taken

ANS:

a) TEM microscope b) SEM microscope

السؤال السادس

A – Discuss Frenkel defect

ANS:

in this case one atom from sublattice moves to a normally empty place in the crystal leaving a vacancy behind, one Frenkle defect consists of an interstitial ion plus a vacancy , because the total number of ions present dos not change

B –What do you know about Miller indices?

ANS:

Miller indices , defined as the reciprocal of the fractional intercepts which the plane makes with the crystallographic axis and represent by (hkl) example

Axial length	4A	8A	3A
Intercept length	1A	4A	3A
Fractional intercept	1/4	$\frac{1}{2}$	1
Miller indices	4	2	1
hkl	h	k	l