REFERENCES

REFERENCES

1- Barrett. C.C. "Strustural of metal" 2nd. edition (1952).

2- Mackenzie. J.D. "Modern aspects of the vitreous state" 3 (1964).

3- Owen. A.E. and Robert. J.M., J-NCS 2 (1970)40.

4- Scher. H. and Montroll. E.V. phys.Rev.B. 12 (1975) 2455.

5- Hill.H., Vangh.W.E., Price.A.H. and Davies.M. "Dielectric properties and molecular behaviour" Van Nostrand (1969).

6- Tauc.J. "Amorphous and liquid semicondutor" Ch. 1(1974)3.

7- Turnbull.D. and Cohen. M.H., J.phys. 29(1958)1049.

8- Turnbull.D. and Cohen.M.H. "Modern aspects of the vitrious state." Vol. 1(1960)38.

9- Uhlmann.D.R., J-NCS 7(1972)337.

10- Comber.P.G.Le and Mort.J. in "electronic and structural properties of amorphous semiconductors" section III(1973).

11- Giridhar.A. and Mahadevan.S.,J-NCS 3(1991)96.

12- Ovshinsky.S.R., Phys.Rev.Letters 21 (1968)1450.

13- Cohen.M.H., Fritzsch.H. and Ovshinsky.S.R.,Phys.Rev.Letters 22(1969)1065.

14- Davis.E.D., and Mott.N.F.Philos.Mag. 22(1970)903.

15- Economou.E.N. Kirkpatric.S., Cohen.M.H. and Eggarter.Phys.Rev. Letters 25(1970 a)520.

16- Anderson.P.W.Phys.Rev. 109(1958)1492.

17- Mott.N.F.: Phlos.Mag. 24(1971)911.
Adv. in phys. 16(1967)49.

18- Mott.N.F.Phlos.Mag. 39(1967 a)835.

19- Cohen.M.H., Fritzsche.H. and Ovshinsky.S.R.Phy.Rev.Letters 22(1969)1065.

20- Roy.R.,J-NCS 3(1970)33.

21- Mott.N.F. and Davis.E.A. "electronic process in non crystalline material" Clarendon press Oxford Ch. 2(1971)9.

22- Marshall.J.M., Owen A.E.philos.Mag. 24(1971)1281.

23- Kastner.M.,Adler.D. and Fritzsche.H.Phys.Rev.Letters 37(1976)1504.

24- Kastner.M., and Phys.Rev.Letters 28(1972)355.

25- Kastner.M., and Fritzsche.H., Philos.Mag. 17(1978)37.

26- Lax.M., Phys.Rev. 109(1958 b)1921.

27- Mattis.D.C., Phys.Rev.Letters 22(1969)936.

28- Cohen.M.H., J-NCS 4(1970)391.

29- Euden.N., and Wilson. J.: elements of solid state physics "Ch. 4(1980)40.

30- Owen.A., J-NCS 25(1977)370.

31- Owen.A.E., Contemp.Phys. 55(1977)1920.

32- Owen.A.E., and Spear.W.E.Phys.Chem.glasses 17(1976)174.

33- Mott.N.F., Davis.E.A., and Street.R.A., Philos.Mag. 32(1975)961.

34- Mott.N.F., Philos.Mag. 34(1976)1101.

35- Abkowitz.M.,Lecomber,P.G., and Spear.W.E.,Commun.on Phys. 1(1976)175.

36- Elliott.S.R., Adv.Phys. 36(1987)36.

37- Long.A.R., Adv.Phys. 31(1982)553.

38- Austin.I.G., and Mott.N.F., Adv.Phys. 18(1969)41.

39- Pollak.M., Philos.Mag. 23(1971)519.

40- Bottger.H., and Bryskin.V.V., Phys.status solidi B.78(1976)415.

41- Butcher.N., and Hysen.K.J. in: proceeding of 7th internat. conf. on amorphous and liquid semiconductors., Edited by Spear.W.E. (1970).

42- Efros.A.L., Philos.Mag.B.43(1981829.

43- Killias.H.R.,Phys.Lett.20(1966)5.

44- Ghosh.A.,Phys.Rev.2(1990)5665.

45- Ghosh.A.,Phys.Rev.B 41(1990)1479.

46- Pike.G.E.,Phys.Rev.B 6(1972)1572.

47- Elliott.S.R.,Philos.Mag.B 40(1979)507.

48- Ghosh.A., and Charkravorty.D.,J. Phys.Condens.matter.3.(1991)3335.

49- Gawish.M., and Saleh.M.N., J.Appl.Phys.51(1)(1980)459.

50- Le Cleac.H., and Palmier.J.F., J-NCS 18(1975)265.

51- Owen.A.E.,glass Ind.48(1967)637,695.

52- Owen.A.E., and Robertson.J.M., J-NCS 2(1970)40.

53- Kitao.M.,Japan.J.Appl.Phys.10,11(1972)1472.

54- Ivkin.E.B., and Kolomiets.B.T.,J-NCS.3(1970)41.

56- Segawa.H.,J.Phys.Soc.Japan.36,4(1974)1087.

57- Sharma.A., and Bhatia.K.L 109(1989)95.

58- Nagels.M.,Tichy.L,Triska.A., and Ticha.H, J-NCS 59,60(1983)1018.

59- Tohge.N.,Minami.T,Mamamoto.Y.,andTanaka.M,J.Appl.Phys.51 (1980)1048.

60- Tohge.N.,Yamamoto,Minami.T.,and Tanaka.M,Appl.Phys.Lett.34 (1979)640.

61- Hench.L.L., and Jenkins.D.A,Phys.Stat.Sol. 20(1967)327.

62- Gupta.H.G.J-NCS 89(1987)49.

63- Ghosh.A., and Charkravorty.D,J.Phys.Condens.Matter.2(1990)5365.

64- Gotz.J.in:"Glass 77" (1977)371.

65- Hench.L.L., and Schaake.H.F,"electrical properties of glass" in:
"introduction to glass science",by. L.D.Pye,H.J.Stevens (1972)583.

66- Tareev.B."Physics of dielectric material" 1st.ed. (1975)141.

67- Daniels.V.V "Dielectric relaxation" Academic press, London (1967).

68- Huang.P., and Huang.X. J-NCS 112(1989)318.

69- Mansingh.A,Reyes.J.M., and Sayer.M,J-NCS 7(1972)12.

70- Mansingh.A.J.Phys.Chem.Solids 36(1970).

71- Som.K.K., and Chaudhuri.B.K.Phys.Rev.B 41. 3(1990)1581.

72- Robert.H., and Doremus in:"Glass science"Ch.2 (1973)190.

73- Bruckner.R., J-NCS 5(1970-1971)177.

74- Austin.I.G., and Sayer.M.,J.Phys. C 7(1974)905.

75- Andreson.P.W.,Ltalperin.B.I., and Warma.C.H. philos.Mag. 25(1972)1.

76- Pollak.M., and Pike.G.E.Phys.Rev.Lett. 28 (1972)1449.

77- Shimakawa.K,Philos.Mag. B.46 (1982)123.

78- Edmond.J.T,J-NCS 1(1965)39.

79- Tohge.N.Minami.T,Yamamoto.Y., and Tanaka.M.J.Appl.Phys.
51(1980)1048.

80- Zuzuki.T.,Saito.S., and Arakawa.W,J-NCS 24(1977)355.

81- Germain.P.,Suquelard.S., and Bourgo .J. in.J-NCS 23(1977)159.

82- Kim.K.S., and Turnbull.D.J.,J Appl. Phys.45(1974)3447.

83- Chiang.Y.S., and Johnson.J.K,J.Appl.Phys. 38(1967)1647.

84- Turabull.D.Contemp.Phys. 10(1969)473.

85- Uhlmann.D.R.:glass formation in glass science 77 edited by:
Gotz.J.(1977)43.
86- Warren.B.E., and Biscoe.J,J.Am.cerm.soc. 21(1938)49.
87- Tammann.G.,Elbrachter.A., Z.anorg.U.allgm.Chem. 207(1932)268.
88- Andonov.P., J-NCS 47(1982)297.
89- Wolng.J., and Kokoszka.R., J-NCS 113(1989)171.
90- Greer.A.L.,Key.engineering Mat.13-15(1987)293.
91-Vogel.W.:phase separation in glass, in: glass 77(1977)171.
92- Drehmann.A.J., and Gree.A.L., Acta Metall 32(1984)323.
93- Hinz.W.in:"proceeding of XIthint.Congress on glass (1977)231.
94- Ok.N.N., and Morrish.A.H,Phys.Rev.B 23(1981)1835.
95- Koster.UWe.in:Metallic and semiconducting glass II(1986)281.
96- Stokkey.S.D., Glast:Ber. 32 K(1959)1,5.
97- Avrami.M.,J.Chem.Phys. 7(1939)1103.
98- Avrami.M.,J.Chem.Phys. 8(1940)212.
99- El-zaidia.M.M., Ammar.A.A.,El-Shafi., and Abou-Ghazala.,
J.Fac.E.duc.Ain Shams.Uni.Egypt(1986).
100- El-Zaidia,Nassar.A., Phys.and Chemist. of glass 22(1981)147.
101- Mattis.D.C.Phys.Rev.Letters, 22(1969)936.
102- Becker.R., Ann.Phys 32(1983)128.
103- El-Zaidia M.M.,Ammar.A.A and Y.L.El-Kady Egyp.J.Phys,
Vol 17, No. 1(1986)17.
104- Arora.R., and Kumar.A.,Revue Phys.Appl.25(1990)169.
105- Pollak.M., and Geballe.T.H.,Phys Rev.122(1961)1742.
106- Shimaka.K.Philos.Mag.B 46(1982)123.

107- Stevels.J.M."The electrical properties of glass"Vol xx(1975)350.

108- Fritzsche.H,Proc.Seventh Int.Conf.on amorphous and liquid Semiconductors.W.E Spear. (1977)3.

109- Kosek.F,Cimple.Z,Mikhailov.M.D., and Karpora.E.E.V,J-NCS (1986)265.

110- Fritzsche.h,Proc.Seventh.Int.Conf.on Amorphous and liquid semoconductors. (1977) p.3.

111- Elliott.S.R.Philos.Mag.B. 36(1977)1291.

112- Kawamoto.Y. and Tsuchihashi.S,J.Am.Ceram.Soc. 52(1969)626.

113- El-Zaidia.M.M.,El-Shafie.A,Ammra.A.A., AboGhazala.M.J.mat.science 22(1987)1618.

The electrical properties of the system Se_{90} Ge_{10-x} In_x (x = 2,4,6) have been measured in three stages, glassy state, crystalline state and supercooled liquid state. The experimental results introduced the following:

1- Increasing of conductivity, dielectric constant, and dielectric loss tangent with temperature for all of compositions in the glassy state.

As the frequency increases, both of dielectric constant and dielectric loss tangent decrease, while the A.C conductivity increases.

2- As the sample transformed into the crystalline state it has been found that the conductivity, dielectric constant and dielectric loss tangent depend on the crystallization tamperature. Moreover the values of these parameters in the crystalline state were higher than that in the glassy state.

The temperature and frequency dependence of the mentioned parameters indicated a similar behaviour.

3- For the first time, it has been used both of the dielectric constant and the dielectric loss tangent to study the phase transformation for the different compositions of the system Se_{90} Ge_{10-x} In_x (x = 2,4,6) by using of the step wise method at the crystallization temperature 120, 130, 140 and 150 °C.

It has been pointed out, by applying of Avrami equation and other equations, that:

a- The order of reaction (n) decreases as the crystallization temperature increases for all of the samples.

b- The activation energy of crystallization increases as the indium content increases in the samples.

C- The radius of the crystalline domain increases as the annealing time increases.

d- The diffusion coefficient increases as the crystallization temperature increases.