تصنيف ديوى:	530
المؤلف:	.Bassyuoni, Fikri M
العنوان:	= Study of Dielectric Properties at Various Temperatures
بيانات أخرى:	دراسة العوازل الكهربية عند درجات الحرارة المختلفة /
بيان المسئولية :	Fikri M. Bassyouni ; supervised by Mohamed S. Ahmed, Younis S. .Selim, Ahmed Sh. Ammar
تاريخ النشر:	.1981
الحجم:	: .p 159
ابعاد الوعاء:	.cm 30
ملخص:	aim of the work is to study mainly the dielectric constant of some The members of the amide group with a special reference to the effect of different concentrations with water, variation of the temperature, and the effect of neutron irradiation, at a frequency of 3 MHz. Moreover at the same time we studied the dielectric constant of neutron irradiated diala-shell B-oil. The dielectric values were determined at varying frequencies keeping the temperature, however aa fixed, This work is .represented in two parts ;Part I constant of the amide group, which We study the dielectric -1 group was so chosen as, contains: IMA, NMF, DMA and IMP. This JJMA and KMF are protic ,due to its different properties. For example while the others, IMA ,solvents which contain free hydrogen atoms .and IMP, are Aprotic with uq free hydrogen atoms Moreover, the effect of polarity of the solvent has been

.considered,THF was selected as a nonpolar solvent
solutions of our solvents with the conductivity water were The
study the effect of the polarity of the amide group on the prepared to
water; furthermore the effect of polarity of water on the polarity of
solvent (THP),2- The used organic solvents, as well as the nonpolar
.water were prepared in pure states conductivity
by adding the adjusted amount of water The solutions ware obtained -3
weights from 10 up to 100 wt$ for to the different percent agea
solvents in steps of
The dielectric constant (€.) and the loss factor (tan o) for these -4
-solutions were also measured at a fre
quency of 3 MHz and at range of temperature from 5 to
o
G in steps of 5 degrees. The temperature was controlled 60
o
.by a thermostat to + 0.5 G
The data obtained from our measurements ?irere in a good -5
previous published results. The lowing table agreement with
:summarises the comparison
It is found tjiat the dielectric constants of the solutions of these -6
solvents with water obey fairly the additivity rule? which states that
lower the addition of a substance of higher dielectric constant to one of
constant than permittivity, would give a mixture with higher dielectric
EMA with that of the second component. Excluded is the mixture of
water at certain
concentrations and temperatures which deviate from that
-o rule. As an example, at temperature 35 C, the concent
wt/S of 1MA, has a dielectric constant 170; at the same 20 ration
the dielectric constant of pure water and pure HMA are ^temperature

.respectively 74.8 and 165

-7 The dielectric constant (C) of the previous solution were found to obey the following relation;

€

bT a e -

• where a and b are constants and T is th© absolute temperature

Exceptions are the solutions of 1MA and NMP with water; for which relation did not obeyed; within the considered temperature tha above *range

-8 -The dielectric constant of pure HMA has a transi o tion at the melting point 28 C. This phenomana, can be observed for individual polar matter, having a distinct melting point. There a jump-like changa in dielectric constant (€) during metling can be observed. As an example, the dielectric constants of MA at temperatures

o

20 and 28 Q were 34 and 172 respectively. This can be attributed to ,fact that at melting point, the specific volume increases sharply the which create space that is required for rotation of the permanent dipole .moment in the direction of the field

-9 The loas factor (tan£) was measured for BMAjPHF, THP and their temperatures. The loss factor (tan£) increases by increasing the temperature, this can be attributed that by raising the temperature, the mobility of free electrons increases. The loss factor of monosubstituted amides with water is so high that the equipment cannot measure it satisfactorily attainable .

-10 The electric conductivity of the solutions was found to obey the following relationship:

A e

.where T s the absolute temperature .Boltsmann’s constant * <kt a The activition energy,11- The study of the variations of the dielectric * constant (C)t the loss factor (tan$) and the electrical ~conductivity of the mentioned solutions y?ith the concen .(trations and at a constant temperature(chosen at 25 C ° / -It was found that, the dielectric constant (£), for mix o tures of DMA, BMP and IHP with water at 25 G decreases by the wt$ of these solutions. While in case of UMA and HHF, increasing dielectric constant increasing by increasing of the wt$ of the the in solution. This can be attributed to the fact that the dielectric solvent constant of monosu-bstituted amides is greater than that of the ciisubstituted amides. Also the monosubstituted amides (protic) have free hydrogen atoms vsfaich associate molecules of water more readily .(than di^ubstituted amides (Aprotic for the disubstituted amide has a ,The loss factor (tanS) at 25 C concentration, for example, the solutions maximum value at a difinite yield a maximum value at of DMA, BMP and THP with water .solvents respectively concentrations 165, 56 and 40 wt$ of these depends mainly on the loss The electric conductivity of these solution in the case of the loss factor, and the curves show the same shape as the pure solvents decreases factor (tan S). The electric conductivity of DMA = 1.2 x IC DMP ^ in the following direction H20 « 1.84 x 10~6 dielectric THP = 0.08 x 10~6. Aluo the <^» 1.1 x 10”*6	
.Dielectric Properties	الموضوع:
.Applied physics	الموضوع:
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