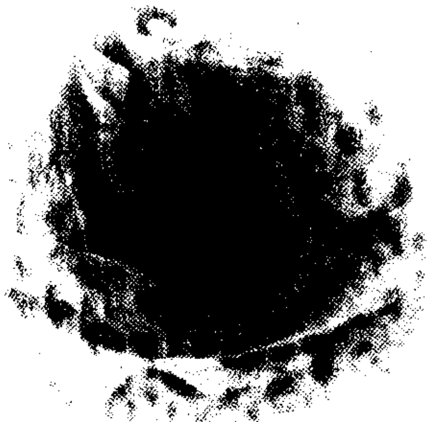
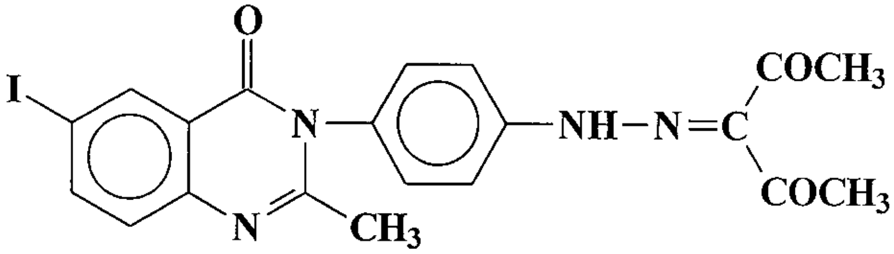
Summary



(3)

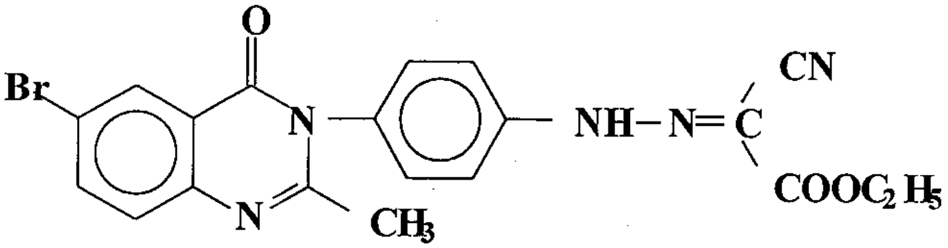
Acetylacetone – 4- [2-methyl –6- Iodo –4 (3H) quinazolinone –3 –yl] phenyl hydrazone.



In the second series: a > b > c > d.

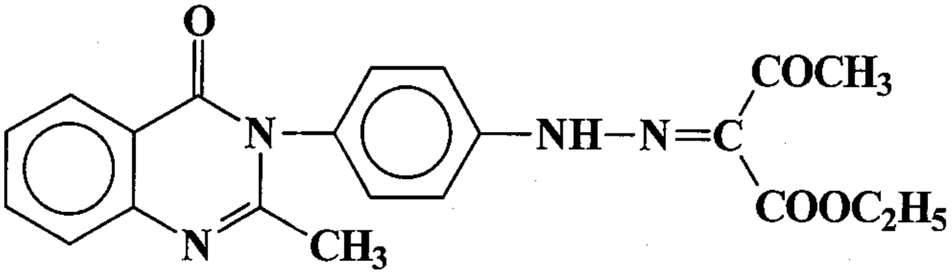
(a)

Ethyl – 4- [2-methyl –6- bromo –4 (3H) quinazolinone –3 –yl] phenyl hydrazo cyanoacetate.



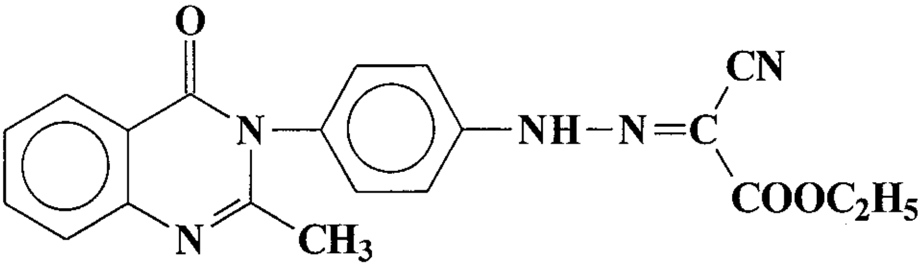
(b)

2 methyl – 3- [4-(N – ethoxy carbonyl –N- acetyle hydrazine) phenyle] 4 (3H) quinazoline.



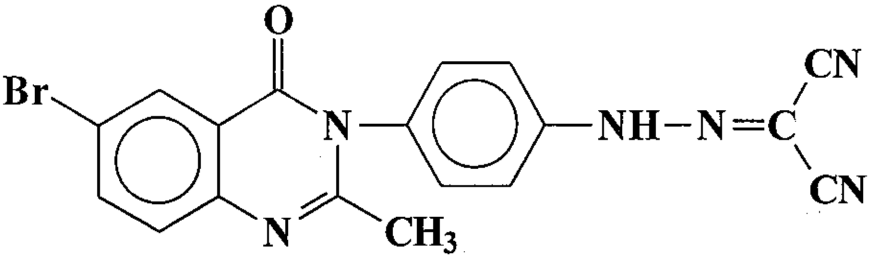
(c)

Ethyl – 4- [2-methyl –4 (3H) quinazolinone –3 –yl] phenyl hydrazo cyanoacetate.



(d)

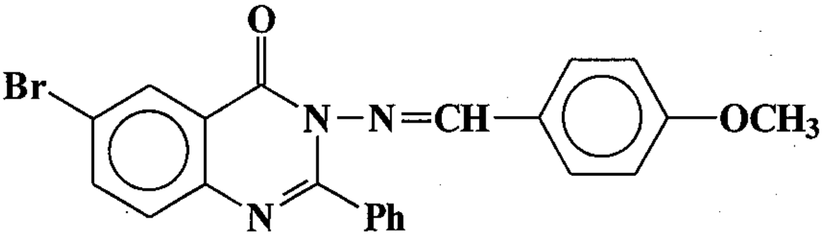
4- [2-methyl –6- bromo –4 (3H) quinazolinone –3 –yl] phenyl hydrazo molononirile.



And in the third series: I> II > III > IV.

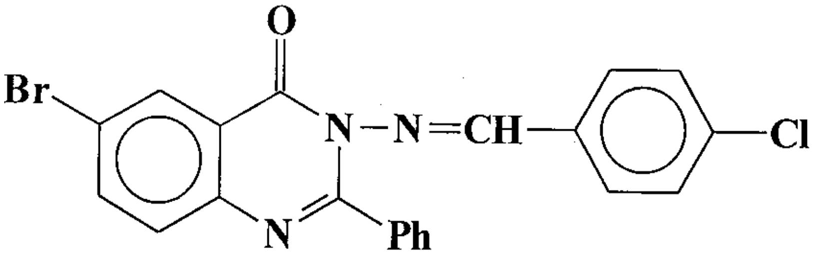
(I)

6- bromo –2– phenyl –3- (4`- methoxy phenyl methylene imino) –4 (3H) quinazolinone.



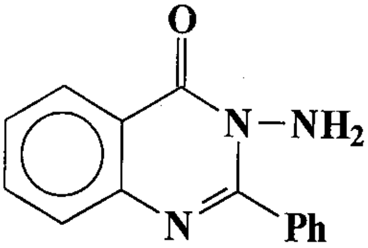
(II)

6- bromo –2– phenyl –3- (4ˋ- chlorophenyl methylene imino) –4 (3H) quinazolinone.



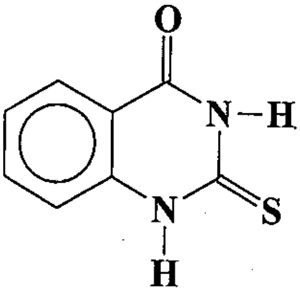
(III)

3- amino – 2-phenyl –4(3H) qinazolinone



(IV)

2- Mercapto – 4 (3H) quinazolinone



The results of inhibition efficiency in case of weight loss and polarization resistance are in good agreement with each other refered to the same order in case of potentiostatic polarization measurements at all the concentrations in the range $1X10^{-7}$ M – $1X10^{-4}$ M.

The effect of temperature on the corrosion inhibition of copper in 0.1M HCl solution was examined over the temperature range 30-50°C using weight loss measurements. The rate of corrosion increases with increase in the temperature together with a decrease in protection efficiency, indicating that inhibition occurs through physical adsorption of the additives. Thermodynamic functions of activation were calculated in presence of $1X10^{-4}$ M, $1X10^{-5}$ M, $1X10^{-6}$ M and $1X10^{-7}$M concentrations of the inhibitors.

Copper corrosion in 0.1M HCl investigated by potentiostatic polarization, polarization resistance and weight loss measurements revealed the same order of inhibition efficiency of the additives. In conclusion, the three techniques used support the assumption that corrosion inhibition primarily takes place through adsorption of the inhibitors on the copper surface. Agreement among these different independent techniques indicates the validity of the obtained results.

Part two includes The specific conductance values of $CuSO_4$ in methanol - water in presence of quinazoline phenyl hydrazone derivatives were measured experimentally and from which the values of molar conductance (Λ) were calculated. The association and dissociation constants of salt in presence of compounds used in methanol - water mixtures for each stoichiometric complex were calculated by applying fouss and Shedlovsky method.

On drawing the relation between the molar conductance and; $(C)^{1/2}$ different straight lines with one break in presence of quinazoline phenyl hydrazone derivatives are obtained for the salt indicating the formation of two stoichiometric complexes between $CuSO_4$ and all ligands used with ratio 1 : 1 ,2 : 1 (M : L).

The association & dissociation constants and the free energies of solvation for each stiochiometric complexes were calculated from Λ^{o} & Λ values and their values follow the order:

In the first series: 1>3>2.

In the second series: b>c>a>d.

In the third series: III>IV.

The associations and the free energies of solvation were also calculated by another method as Fuoss — Kraus method which is a graphical one.

The two data gave similar results and trend but the second method showed little higher results.

It was also concluded from the calculated conductmetric data that the dissociation constants for copper ions decreased by increase of the metal concentration due to the association phenomenon. Also the increase of solvent percentages were followed by also the decrease in the dissociation constants due to the solvation phenomenon.

All the association constants and free energies of solvation are bigger for 1 : 1 stoichiometric complexes than that for 2 : 1 (M : L) ratios . This trend due to the lower Λ^{o} and Λ values for the latter than the first types. Also the feasiability for 2 : 1 stoichiometric complexes are lesser in extent than that of the 1 : 1 ones .

For 1: 1 stoichiometric complexes formed between metal and ligand it was found that group 3 gave the most association constant and the thermodynamic parameters.

But in case of 2: 1 (M: L) stoichiometric complexes group 1 gave more association and thermodynamic parameters due to then- bigger ability for forming electrostatic complexes.

Also it "was found that the association constants to $CuSO_4$ in presence of organic ligands used increase when the temperature increase because of the decrease in complexation when the temperature increase , by increasing the ions concentrations in solution increase.

The free energies of association of each stoichiometric complex were calculated from the measured association constants values. Also the enthalpy (ΔH) and entropy ($T\Delta S$) calculated.

The data show the free energies and enthalpies for the different stoichiometric complexes increased with the increase of temperature but the entropies showed an opposite trend.

All the thermodynamic parameters were increased by increasing the percentage of alcohol due to the increase in the ion - solvent interactions.