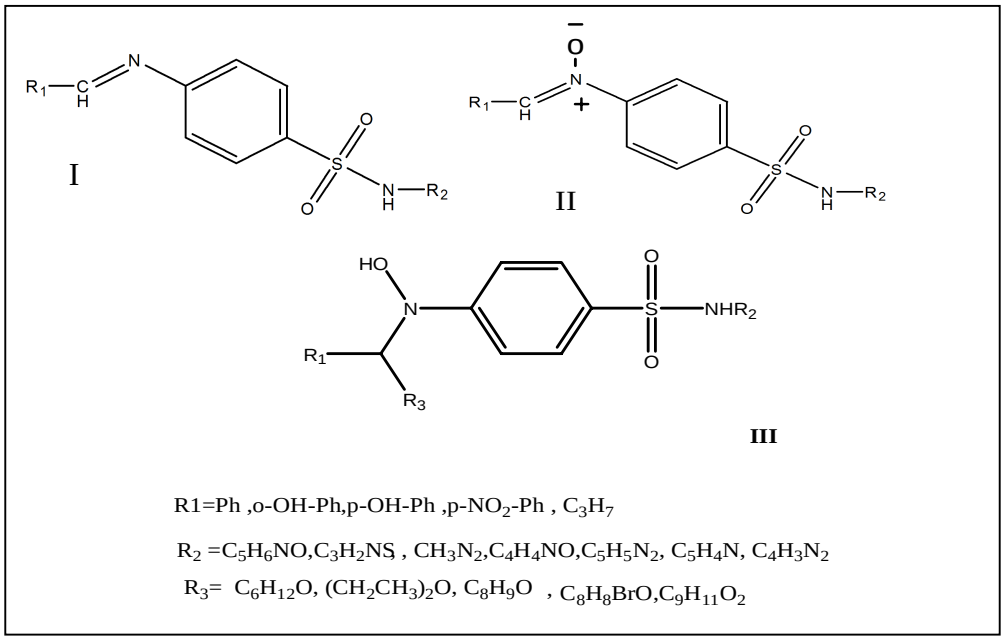
# SUMMARY

This study is concerned with the synthesis, characterization, biological activity and study of reduction -coupling of nitrone compounds with some ketones leading to electrosynthesis series of some new hydroxylamines.

Twenty three of Schiff base compounds were synthesized by condensation reaction of some sulfonamids with aldehydes.




A series of nitrones II have been synthesized by oxidation of Schiff bases by peracetic acid.

One of these nitrones was reduced by sodium cyano borohydride $NaBH_3CN$ to obtain hydroxyl amine III that can be used as a starting material to grow new nitrone by reacting it with other aldehyde or ketones.

Several nitrones were subjected to Cyclic Voltammetry (CV) in order determine specifically the required potentials to reduction –coupling with

numbers of ketones through electrosynthesis process. Thus, on adopting of CV measurements, some of synthesized nitrones subjugate to electrochemical reduction-coupling with number of ketones to attain III.

All prepared compounds were characterized by using elemental analysis and FTIR spectroscopy. Some of these are detected by UV-Visible, $^{1}$H-NMR, $^{13}$C-NMR and mass spectroscopy. The results are in good compatibility with the calculated values and the other techniques show that the prepared compounds have the expected molecular structures.

UV-Visible spectra of nitrones, showed distinguished absorption bands within the regions (294-296 nm) in DMF and (290-304) in DMSO which may be attributed to the $\pi \rightarrow \pi *$ transitions of $C=N^{+}\text{-}O^{-}$.

The IR spectra of Schiff bases showed an absorption band in the range (1616-1662 $cm^{-1}$) which may be assigned to stretching vibrations of C=N. Also, IR spectra of nitrones showed two absorption bands in the ranges (1137-1186) and (1595-1650 $cm^{-1}$) which are related to the stretching vibrations of N→O and C=N group, while chemical reduction for one of these nitrones to hydroxyl amine gives the IR spectrum which contains absorption for -OH band at region (3345-3500 $cm^{-1}$) and absence of absorption C=N group. This result emphasized the occurrence of reduction.

The antibacterial activity of synthesized nitrones compounds against Gram positive bacteria Staphylococcus aureus and Gram negative bacteria Escherichia coli showed that most synthesized nitrone compounds exhibited a good activity against bacteria, especially in compounds S7 and N7 because of the presence of nitro group which is already a polar group one. The Schiff base S5 when converted to nitrone N5, the activity is changed from *E. coli* to *S. aureus* as a result of

modification in polarity of compound, therefore N5, showed very good activity as compared with standard drugs.

FTIR spectra of electro synthesized compounds provided similar results compared with chemical reduction. Also, the disappearance of C=N bands and, the appearance of absorption ⁻OH group in vibration (3394-3498 $cm^{-1}$) have been noticed.

The $^{1}$H-NMR spectra of nitrones showed singlet signal in the regions 7.94-9.73 ppm which is attributed to the proton of nitrone groups -CH=NO.

Also, the $^{1}$H-NMR of aromatic protons of nitrones appeared at range (6.02-8.30 ppm). The $^{1}$HNMR spectra were shown in Figures (3-31) to (3-44).Also, some of nitrones characterized by mass spectra were showed the molecular ion M+ peaks.

Some selected nitrones and electrosynthesized compounds were study by cyclic voltammetry and characterized by CHN analysis, $^{1}$HNMR, $^{13}$CNMR and mass spectra, which indicate that the synthesized compounds were as expected.