CHAPTER 4
CONCLUSION

Fifteen new ionic-organic compounds which were seven compounds of aryl ethenylpyridinium benzenesulfonate derivatives and eight compounds of aryl ethenylquinolinium benzenesulfonate derivatives were synthesized. Their structures were elucidated by spectroscopic techniques. Nine of these compounds namely:

4-[(*E*)-2′-(4″-Hydroxy-3″-methoxyphenyl)ethenyl]-1-methylpyridinium 4-chlorobenzenesulfonate **(B2D)**,

4-[(*E*)-2′-(4″-Hydroxy-3″-methoxyphenyl)ethenyl]-1-methylpyridinium 4-bromobenzenesulfonate **(B3D),**

4-[(*E*)-2′-(3″-Hydroxy-4″-methoxyphenyl)ethenyl]-1-methylpyridinium 4-bromobenzenesulfonate **(B4E)**,

2-[(*E*)-2′-(4″-Hydroxy-3″-methoxyphenyl)ethenyl]-1-methylquinolinium 4-methylbenzenesulfonate **(B1F),**

2-[(*E*)-2′-(4″-Hydroxy-3″-methoxyphenyl)ethenyl]-1-methylquinolinium 4-methoxybenzenesulfonate **(B2F)**,

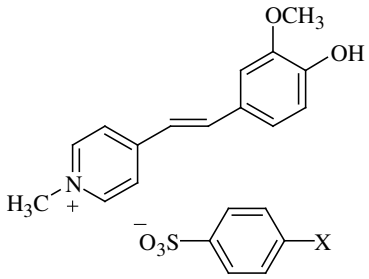
2-[(*E*)-2′-(4″-Hydroxy-3″-methoxyphenyl)ethenyl]-1-methylquinolinium 4-chlorobenzenesulfonate **(B3F)**,

2-[(*E*)-2′-(4″-Hydroxy-3″-methoxyphenyl)ethenyl]-1-methylquinolinium 4-bromobenzenesulfonate **(B4F)**,

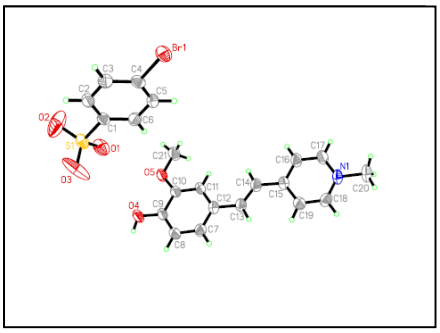
2-[(*E*)-2′-(3″-Hydroxy-4″-methoxyphenyl)ethenyl]-1-methylquinolinium 4-methylbenzenesulfonate **(B1G)** and

2-[(*E*)-2′-(3″-Hydroxy-4″-methoxyphenyl)ethenyl]-1-methylquinolinium 4-chlorobenzenesulfonate **(B3G)** were also determined by the single crystal X-ray structure determinations. It was found that **B2D**, **B3D**, **B4E** and **B1G** were crystallized out in centrosymmetric space group, **P-1** (for **B2D**, **B3D** and **B4E**) and **$P2_{(1)}/c$** (for **B1G**), thus they did not exhibit the second-order nonlinear optic properties whereas the compounds **B1F-B4F** and **B3G** were crystallized out in non-centrosymmetric space group, **Pc** (for **B1F-B4F)** and **$P2_{(1)}2_{(1)}2_{(1)}$** (for **B3G**), meaning

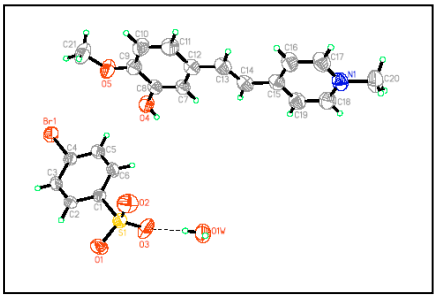
that these compounds showed nonlinear optical properties. Their SHG measurements were made in accordance with classical powder method developed by Kurtz and Perry (1968). It was found that the SHG efficiency of the crystals of **B1F**, **B2F**, **B3F**, **B4F** and **B3G** were about 2.10, 0.45, 0.50, 0.80 and 0.85 times that of urea, respectively.



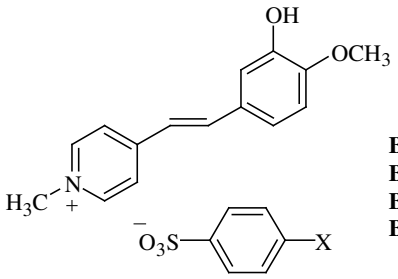
B1D : X = OCH_3
B2D : X = Cl
B3D : X = Br



B2D

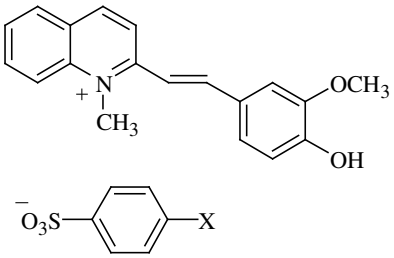


B3D

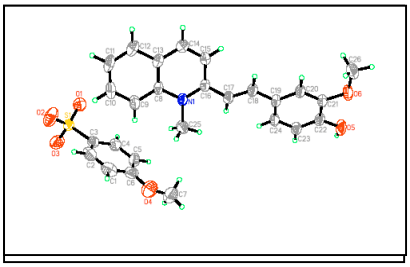


B1E : X = CH_3
B2E : X = OCH_3
B3E : X = Cl
B4E : X = Br

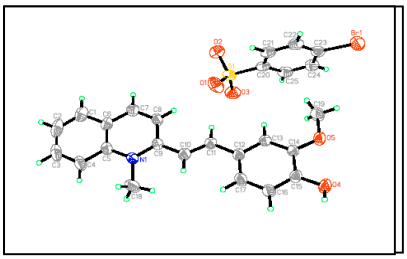
B4E



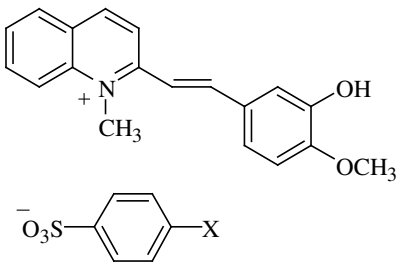
B1F : X = CH_3
B2F : X = OCH_3
B3F : X = Cl
B4F : X = Br



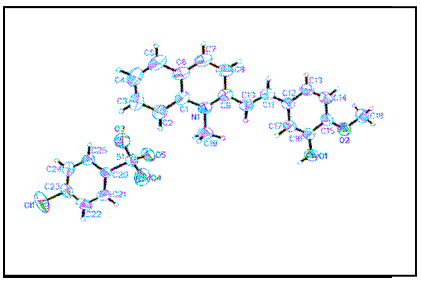
B1F **B2F**



B3F **B4F**



B1G : X = CH_3
B2G : X = OCH_3
B3G : X = Cl
B4G : X = Br



B1G **B3G**