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# SYNTHESIS AND CHARACTERIZATION OF SUBSTITUTED-BENZOYLTHIOUREA VALINE AND THREONINE DERIVATIVES

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Study of benzoylthiourea derivatives has received immense attentions from researchers worldwide due to their versatility in many fields. Owing to the great potentials they offered, therefore, this research project was carried out. In this study, twenty substituted-benzoylthiourea amino acid have been successfully synthesized and characterized using FT-IR spectroscopy, UV-Vis spectrophotometer, NMR spectroscopy and Mass Spectrometry. To be specific, sixteen new compounds have been obtained, while four compounds have been previously reported. Compound 4-MeOBTT was obtained as single crystal and it has been further characterized by Single Crystal X-Ray Crystallography. The FT-IR spectra demonstrated the presence of six important absorption bands of *ν*(N-H), *ν*(O-H), *ν*(C=O-OH), *ν*(C=O-NH), *ν*(C=C) and *ν*(C=S) observed within range of 3171-3486 $cm^{-1}$, 2962-3302 $cm^{-1}$, 1703-1768 $cm^{-1}$, 1655-1703 $cm^{-1}$, 1499-1560 $cm^{-1}$ and 703-795 $cm^{-1}$, respectively. Meanwhile, UV-Vis spectra exhibited the presence of two chromophores corresponded to the n-π* and π-π* transitions. Proton NMR spectra displayed all of the expected resonances of (-C=O-N*H*) and (-C=S-N*H*) appeared in the range of $\delta_H$ 9-12 ppm and 10-11 ppm. Whereas, the $^{13}C$ NMR spectra showed the existence of three main resonances of C=S, C=O-OH and C=O-NH appeared downfield at

approximately $\delta_C$ 180-182 ppm, 170-175 ppm and 165-171 ppm, respectively. Mass spectra obtained proved the presence of molecular ion peaks at the expected mass to charge ratio. From the X-ray crystallography analysis, only one molecular structure has been obtained which was for compound 4-MeOBTT. Two independent molecules in an asymmetric unit have been stabilized by intramolecular hydrogen bonds. The packing diagram showed the presence of intermolecular hydrogen bonds viewed down the *a* axis. All of the bond lengths and angles were in normal ranges. As for biological application, all of the compounds were screened for their antibacterial activity against *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Salmonella typhimurium* and *Escherichia coli*. Result obtained revealed that no compounds were able to inhibit the growth of the tested bacterial strains.