

Comparison between Cold Temperature ($\leq 4^{\circ}\text{C}$) and Room Temperature ($\approx 25^{\circ}\text{C}$) Mediated Synthesis for Putrescine-Sulphur Compound

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ABSTRACT

Objectives/Research Problem: Despite most anticancer drugs possess potent cell killing activity in vitro studies; the selective delivery of drugs to cancer cells is thus far becomes a major challenge to oncology. The non-specific actions of drugs on healthy cells cause many restrictions in clinical use due to their systemic toxicity. In respond to this matter, specific targeting of anticancer drugs towards cancer cells can be achieved by attaching them to a molecule that is transported into cancer cells via a selective transport system. One of the selective transport system that is directly associated with cancer cells are the polyamine transport system. Sulphur atoms were attached to a polyamine to reduce the effects of cancer cells as sulphur were known for its anti-cancer properties.

Materials and Method: The putrescine containing sulphur compound were synthesized using two different methods. The first method involved the synthesis done in a cold environment while the other in a room temperature environment.

Results and Discussion: The temperature differences had shown to influence the yield as well as the chemical structure of the drug. The effect could also be seen on the amount of solvent used during the process. For the room temperature mediated synthesis, the formation of solid compounds produce was higher and faster as compared to the cold mediated synthesis. The results were probably due to the energy required to form the solid compounds.

Conclusion: Repetition of both methods showed that it was dependable as it produced the same compounds based on the Fourier transformed infrared spectroscopy results. In comparison, the room temp mediated synthesis was more efficient as it produced better yield.

KEYWORDS: Method Optimization, Organic Synthesis, Polyamine Compound

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