Synthesis of new s-triazine bishydrazino and bishydrazido based polymers and their application in flame retardant polypropylene composites

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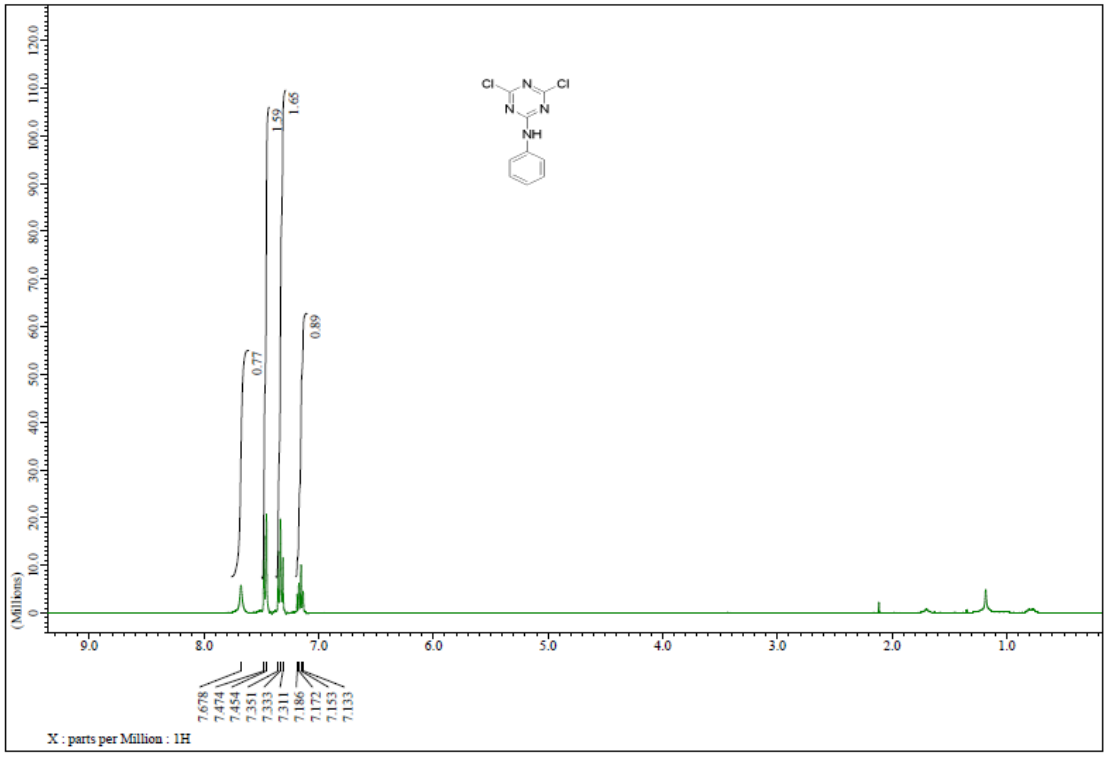
Method S1

General method for the synthesis of 2,4-Dichloro-6-substituted-s-triazine derivatives 2a-c 2,4,6-Trichloro-1,3,5-triazine (cyanuric chloride, 20 mmol) was dissolved in acetone (100 mL), and then added to an aqueous solution of amine such as (aniline, p-bromoaniline, or p-methoxyaniline 20 mmol,) in acetone-water (100 mL, 1:1) contained NaHCO3 (20 mmol) at 0 ^{o}C. After complete addition, the reaction mixture was stirred for 2h at 0 ^{o}C followed by addition excess of water. Acetone was removed under vacuum and the solid product was collected by filtration and then dried to afford 2,4-dichloro-6-substituted s-triazine 2a-c in good yields and purities.

Method S2

General method for the synthesis of 2,4-dihydrazino-6-substituted-1,3,5-Triaizne derivatives 3a-c Hydrazine hydrate (80%) in acetonitrile (20 mL) was added dropwise to a solution of 2a-c (20 mmol) in ethanol (50 mL) at room temperature. The reaction mixture was stirred under refluxed for 3 h. The excess of solvent and hydrazine was removed under reduced pressure and the crude white solid was collected by filtration, washed with cold ethanol, ether, and then dried at room temperature to give the desired bis-hydrazino derivatives with high purity as observed from TLC (methanol-chloroform; 2:8). The products were used directly to the next step without further purification.

Figure S1: 1H and 13C NMR for 2a



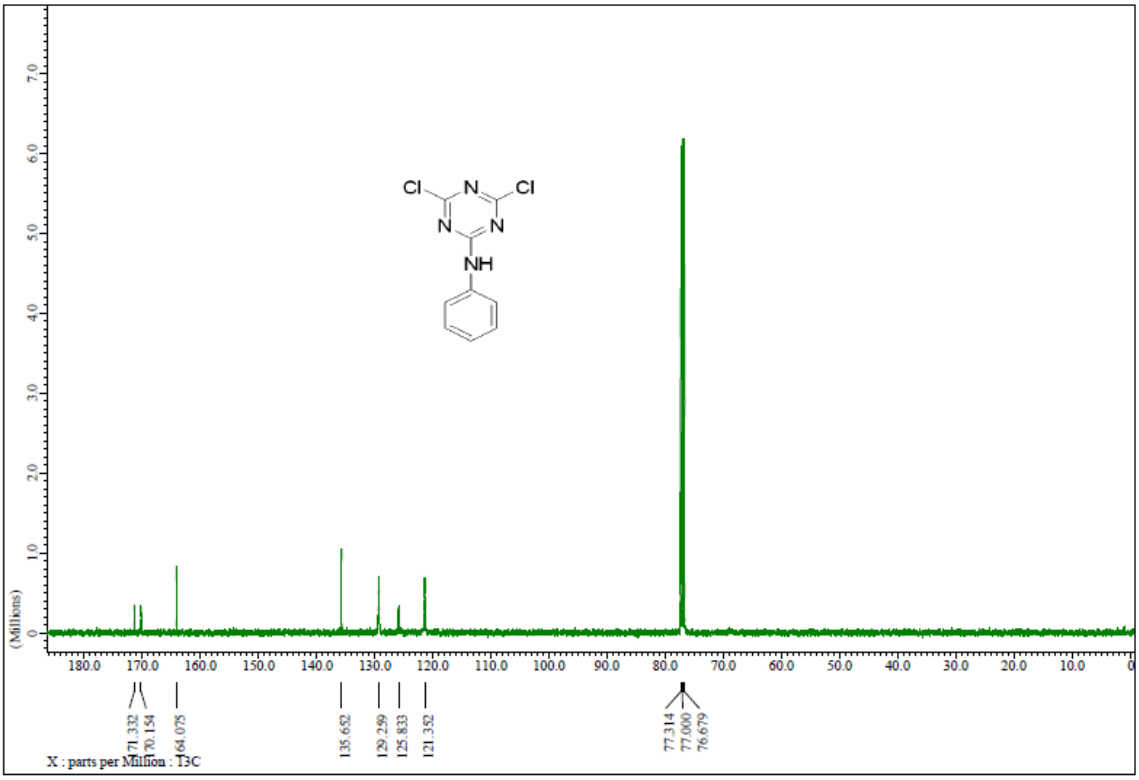
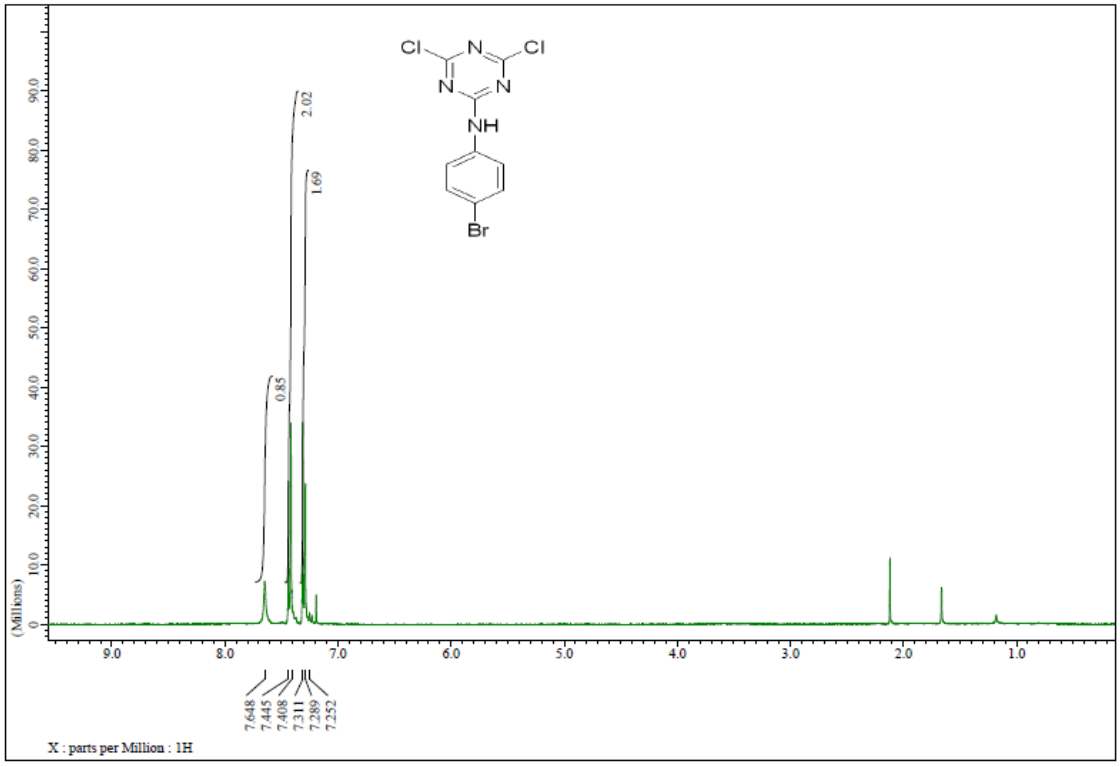


Figure S2: 1H and 13C NMR for 2b



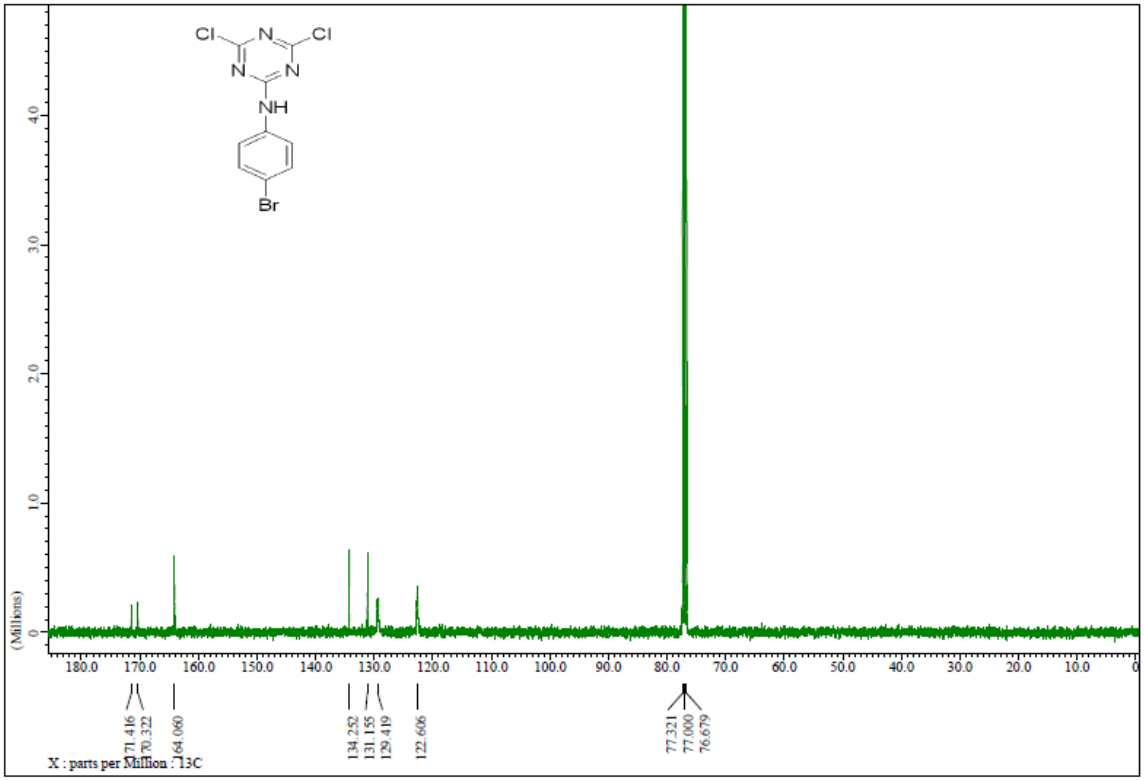
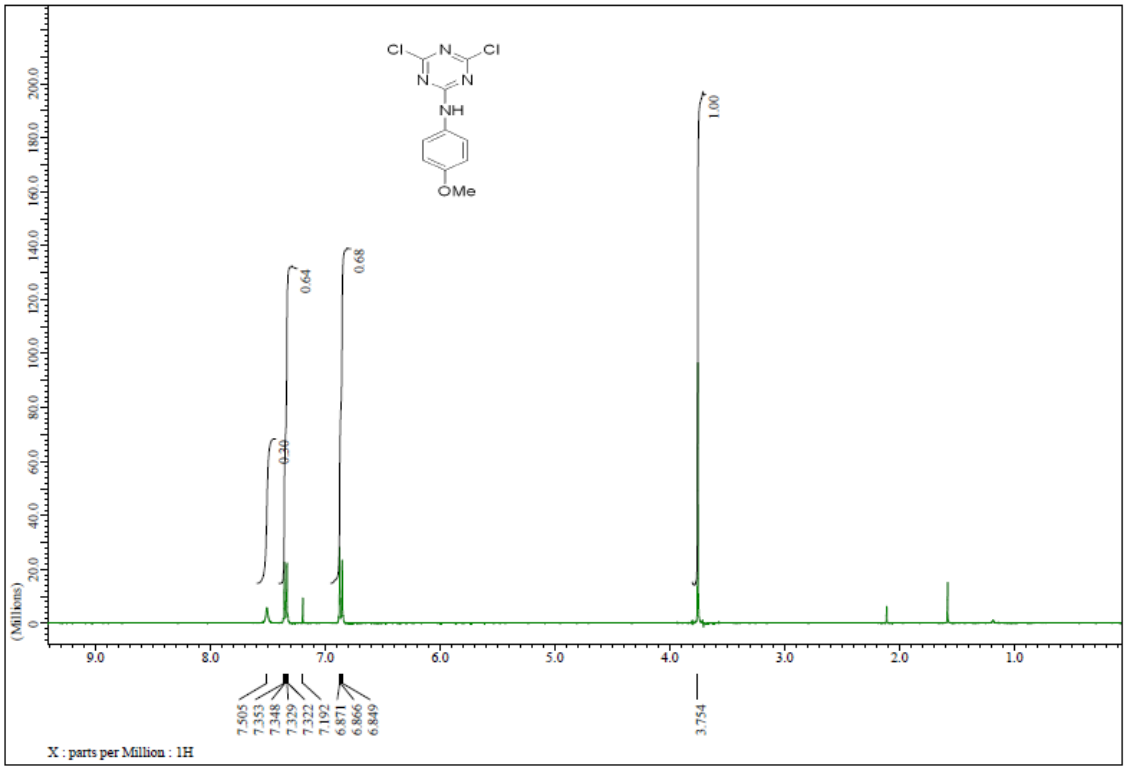


Figure S3: 1H and 13C NMR for 2c



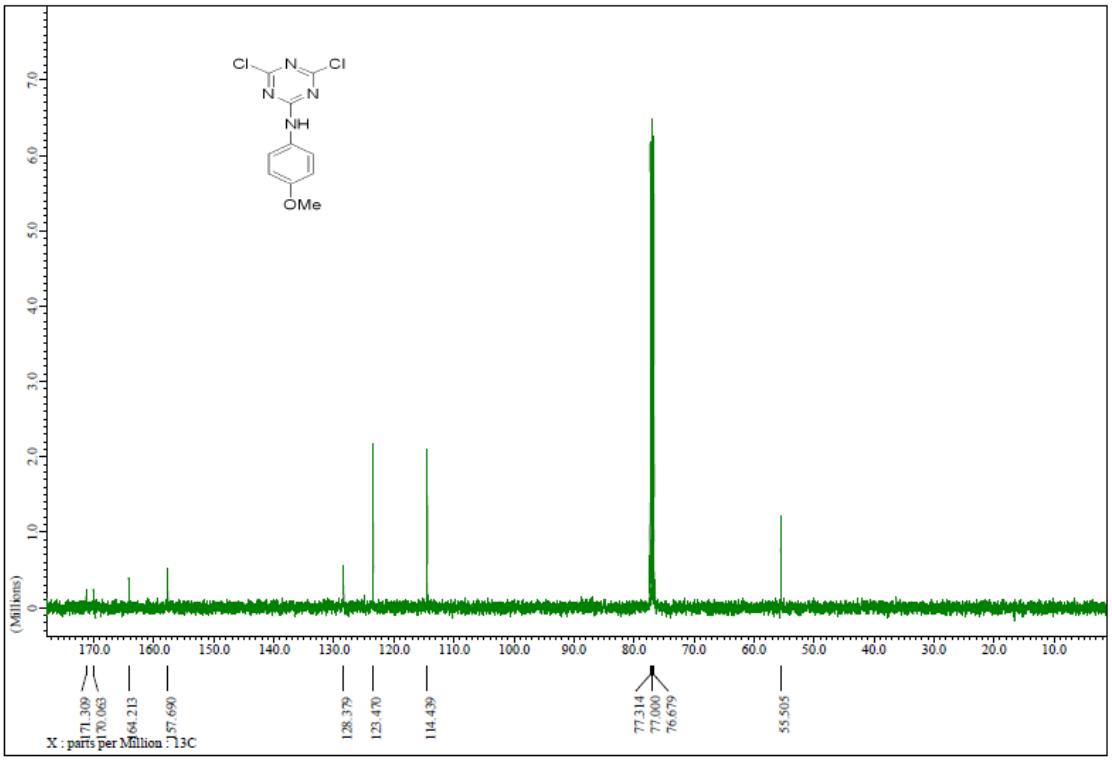


Figure S4: DSC full cycle of 5a-c samples

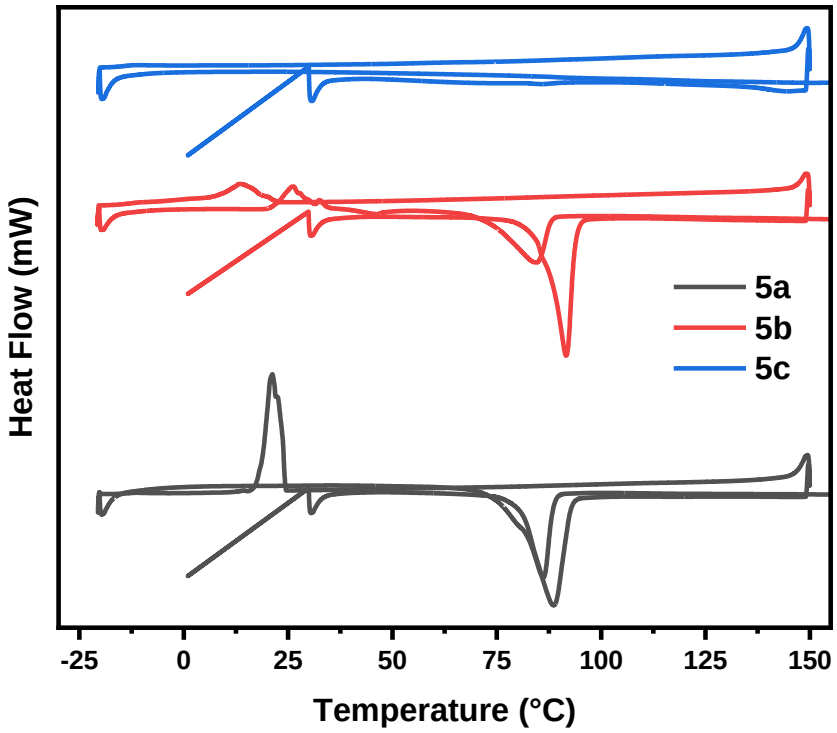


Figure S5: DSC full cycle of 7a-c samples