Synthesis and characterization of new 3,4-dihydro-2H-benzo- and naphtho-1,3-oxazine derivatives

ABSTRACT

New 1,3-benzoxazine and naphthoxazine monomers were synthesized using a modified step-wise technique in which formaldehyde was replaced with methylene bromide for ring-closure reaction in the last synthetic step. Salicylaldehyde and 2-hydroxy-1-naphthaldehyde were used as the aromatic aldehydes and 4-fluoroaniline, 4-butylaniline, hexamethylenediamine, p-phenylenediamine and 2-aminothiazole were used as the primary amines. Condensation of the aromatic aldehydes and the aromatic primary amines in absolute ethanol gives imine compounds which on reduction with sodium borohydride in methanol give 2-hydroxybenzylamines/2-hydroxynaphthylamines. Ring-closure reaction between 2-hydroxybenzylamines/2-hydroxynaphthylamines and methylene bromide in absolute ethanol gives the 1,3-benzoxazines and naphthoxazines in good yields. The structures of the new 1,3-benzoxazine and naphthoxazine monomers were confirmed by FT-IR, 1H NMR and 13C NMR spectral analysis, Mass spectroscopy (GC-MS) and elemental analysis. The mass spectrum of the synthesized compounds showed molecular ion peaks centered at m/z 229, 218, 316, 317, 444 and 268 which are equivalent to the molecular weights of the new synthesized compounds a, b, c, d, e and f, respectively. Results of elemental analysis also confirm the calculated result to be in agreement with the experimental result.

Keyword: 1,3-benzoxazines; 1,3-naphthoxazines; Characterization; Methylene bromide; Modified step-wise process