Indian Journal of Chemistry - Section B Organic and Medicinal Chemistry
Volume 49, Issue 2, February 2010, Pages 203-208

ISSN: 03764699
CODEN: IJSBD
Document Type: Article
Source Type: Journal

View references (12)

Modern Friedel-Crafts chemistry. Part 30[1] facile synthesis of isomeric tri-and tetramethyltetrahydrophenanthrenes via rearranged cycloalkylation of suitably methylated 1-(1-and 2-naphthyl)-3-pentanols

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Abstract

Facile methods for the synthesis of isomeric tri-and tetramethyl-tetrahydrophenanthrenes (11, 18, 21, and 27) have been accomplished through rearranged Friedel-Crafts cycloalkylation of naphthylpentanols 1-4, respectively. Thus, treatments with the mild 85% H_2SO_4, H_3PO_4 and $A1C1_3/CH_3NO_2$ catalysts produced 1,1,2-trimethyl-1,2,3,-tetrahydropenanthrene 11 from 2,2-dimethyl-5-(1-naphthyl)-3-pentanol 1, 3,4,4-trimethyl-1,2,3,4- tetrahydrophenanthrene 18 from 2,2-dimethyl-5-(2-naphthyl)-3-pentanol 2, 1,1,2,2-tetramethyl-1,2,3,4-tetrahydrophenanthrene 21 from 2,2,-trimethyl-5-(1- naphthyl)-3-pentanl 3 and 3,3,4,4-tetramethyl-1,2,3,4-tetrahydropenanthrene 27 from 2,2,3-trimethyl-5-(.-naphthyl)-3-pentanol 4. Treatment with the strong $A1C1_3$ catalyst resulted in varying amounts of side products. The starting and final products were characterized by elemental analysis and IR, ^1H NMR and MS data.

Language of original document

English

Author keywords

1,1,2,2-and 3,3,4,- tetramethyltetrahydrophenanthrenes; 1,1,2-and 3,4,4-trimethyltetrahydrophenanthrenes; Carbocation rearrangements; Friedel-Crafts cycloalkylation

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