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2-Benzothiopyrylium salt 1 reacted with 1,3-dienes 2 in the presence of methanol to afford benzo-fused bicyclo[2.2.2] compounds 3, while in the absence of methanol cycloaddition of 1 with 2,3-dimethylbuta-1,3-diene 2a afforded a novel benzo-fused tricyclic compound 4a, whose structure has been confirmed by X-ray crystallography. A plausible mechanism for the formation of the cycloadducts 3 and 4a is discussed in terms of a $[4^+2]$-type polar cycloaddition.

Polar Cycloaddition of 1-Benzothiopyrylium Salts with Conjugated Dienes and Some Transformations of the Cycloadducts.

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Polar cycloaddition of 1-benzo[b]thiopyrylium salts 1 with conjugated dienes proceeds regio- and stereo-specifically to afford the corresponding benzo-fused bicyclic sulfonium salts 2 in good yields. Reaction of the cycloadduct 2 with nucleophiles such as methanol or water causes ring opening to give 2-(bu-2-enyl)- and 2-(but-3-enyl)-substituted 2H-1-benzothiopyrans 3 and 4. Treatment of the cycloadduct 2 bearing a cyano group at 9-position with a variety of bases affords the spirocyclopentene derivative 5 and the spiro-1,2-dioxolane derivative 6. A mechanism involving a biradical intermediate is discussed for the formation of the above products 5 and 6 on the basis of chemical evidence. Reduction of the cycloadduct 2 with sodium borohydride or sodium cyanoborohydride is also described.

Effect of Crude Fractions *Psoralea corylifolia* Seed Extract on Bone Calcification

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Non-polar crude fractions (HO-O and HO-1) of an acetone extract of *Psoralea corylifolia* seeds were administrated orally to untreated and experimental rachitic rats. In the biological screening of the fractions, HO-1, an elution with n-hexane-ethyl acetate by column chromatography over silica gel of the acetone extract, untreated rats showed a significant elevation of the serum inorganic phosphorus and revealed histomorphometrically a significant increase in bone calcification. These results suggested that HO-O and HO-1 are useful as a remedy for bone fracture, osteomalacia, osteoporosis, and related conditions.