SYNTHESES OF HETEROCYCLIC COMPOUNDS
FROM TRIS(TRIFLUOROMETHYL)CYCLOPROPENYL TRIFLUOROMETHYL KETONE

The cyclopropenylketone (1) has an interesting structure: it contains a strained double bond in a three-membered ring and a carbonyl group, both of which can be converted to other functional groups. We now report the syntheses of unique heterocyclic compounds from 1.

1: Reaction of 1 with trifluoroacetamidine in the presence of titanium-tetrachloride gave 1,2,4,6,7-pentakis(trifluoromethyl)-3,5-diazatricyclo-[4.1.0.0^2,7]hept-3-ene (2). Compound (2) is the first example of valence bond isomers of 1,3-diazepline derivatives which contain a bicyclobutane part. Compound (2) isomerized to 1,3,5,6,7-pentakis(trifluoromethyl)-2,4-diazabicyclo-[3.2.0]hepta-2,6-diene (3) by thermolysis or UV irradiation. Thermolysis of 3 gave tetrakis(trifluoromethyl)pyrrole. UV irradiation of 3 gave tris(trifluoromethyl)imidazole.

2: Reaction of 1 with various azo compounds and triphenylphosphine gave unique heterocyclic compounds (4a,b,5,6). Tetrakis(trifluoromethyl)pyridazine was derived from 4a.

![Chemical structures](4a: R = Ph, 4b: R = CH3, 5, 6 = CF3)