ketodinitrile 58 was characterized by elemental analysis and by hydrolysis to the known cyclopentanonedipropionic acid (59).

Wolff-Kishner reduction (Huang-Minlon modification) of 58 afforded an acid, the melting point of which was several degrees below that of the pure trans-dipropionic acid 53. The infrared spectrum of this material appeared to be identical to that of 53, and the mixture melting point with 53 was undepressed. Subjection of the ethyl ester of the acid to gas-liquid chromatographic (GLC) analysis on several different columns revealed only one peak. Based on these results, it was concluded that the acid obtained by Wolff-Kishner reduction of 58 was a reasonably pure sample of the desired trans-dipropionic acid 53.

The formation of predominantly trans-1,3-cyclohexanedipropionic acid (62) by the Wolff-Kishner reduction of 56 has also been observed. In this case it was postulated that under the strongly basic conditions of the reaction an equilibrium exists between the cis and trans isomers 56 and 60. The trans isomer 60 preferentially forms the intermediate hydrazone 61 because of steric interference by a "2-alkyl ketone" effect rather than the cis-hydrazone. The trans-hydrazone 61 then undergoes decomposition to the trans-dipropionic acid 62. A similar explanation could apply in the preferential formation of 53 by