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# Consecutive fragmentations of the cubane-like zinc cluster $[CH_3Zn(O\text{-}i\text{-}C_3H_7)]_4$ upon electron ionization†

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The sequential dissociations of the tetranuclear zinc cluster-ion $[(CH_3)_3Zn_4(O\text{-}i\text{-}C_3H_7)_4]^+$ obtained by dissociative electron ionization of neutral $[(CH_3)Zn(O\text{-}i\text{-}C_3H_7)]_4$ are investigated by tandem mass spectrometry. After initial loss of a neutral $(CH_3)Zn(O\text{-}i\text{-}C_3H_7)$ unit to afford $[(CH_3)_2Zn_3(O\text{-}i\text{-}C_3H_7)_3]^+$, hydrogen migration leads to the expulsion of neutral acetone concomitant with $[(CH_3)_2Zn_3(O\text{-}i\text{-}C_3H_7)_2(H)]^+$ as ionic fragment. Unimolecular dissociation of the latter gives rise to $[(CH_3)_2Zn_2(O\text{-}i\text{-}C_3H_7)]^+$ and neutral $HZn(O\text{-}i\text{-}C_3H_7)$. As demonstrated by collisional ionization of the neutral product, in the fragmentation of the dinuclear cluster $[(CH_3)_2Zn_2(O\text{-}i\text{-}C_3H_7)]^+$ neutral $CH_3ZnH$ is formed, rather than the more stable fragments $Zn + CH_4$. From the resulting mononuclear species $CH_3Zn(OC(CH_3)_2)^+$ acetone is eliminated to afford $CH_3Zn^+$ as a quasi-terminal fragment ion.