Reaction of 3-ferrocenylpropynal with iron carbonyl and chalcogenised iron carbonyl clusters: Formation of new ligands; $[Fe(CO)_3\text{-}\eta^4\text{-}(FcC_2CHO)_2]$, $[Fe(CO)_2\{\eta^2:\eta^2\text{-}(FcC_2CHO)_2Fe(CO)_3\text{-}\mu\text{-}CO\}]$ and 1,2,3-triselenole

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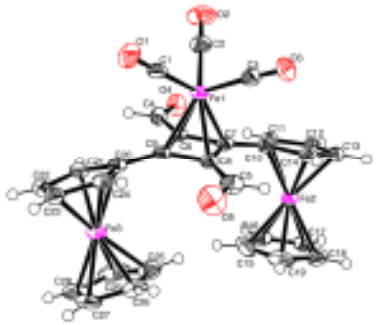
In continuation of our earlier observation on reactivity of mono-substituted acetylenes[1-4] towards mono-nuclear metal carbonyls and chalcogen stabilized metal carbonyl clusters, we now observe that reaction of 3- ferrocenylpropynal and $Fe(CO)_5$ forms $[Fe(CO)_3\text{-}\eta^4\text{-}(FcC_2CHO)_2]$ (**1**) and $[Fe(CO)_2\{\eta^2:\eta^2\text{-}FcCC(CHO)C(Fc)C(CHO)Fe(CO)_3\text{-}\mu\text{-}CO\}]$ (**2**), (Fc= $C_{10}H_9Fe$), as a result of [2+2]- cyclization and head to tail C-C coupling of the alkynes. $Fe_3Se_2(CO)_9$ cluster with 3-ferrocenylpropynal yields a novel 5-ferrocenyl-1,2,3-triselenole-4-carbaldehyde ring (**3**) and an intermediate compound, $[(CO)_6Fe_2\{\mu\text{-}SeC(Fc)=C(CHO)Se\}]$ (**4**), which on decarbonylation by $Me_3NO.2H_2O$ leads to formation of **3**. Contrast in behavior of analogous $Fe_3S_2(CO)_9$ and $Fe_3Te_2(CO)_9$ clusters is observed as they afford only $[(CO)_6Fe_2\{\mu\text{-}SC(Fc)=C(CHO)S\}]$ (**5**) and $[(CO)_6Fe_2\{\mu\text{-}TeC(Fc)=C(CHO)Te\}]$ (**6**), respectively.



1

3

Figure 1. Molecular structures of **1**, and **3**

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