The crystal structures of three complexes of mercury(II) halides with tetrahydrothiophene (THSe) have been solved, viz. HgCl$_2$·THSe, HgBr$_2$·THSe and HgI$_2$·THSe. The HgCl$_2$·THSe structure (C. Stålhandske and F. Zintl, Acta Cryst., 1986, C41, 1449-1450) is isomorphous with the corresponding tetrahydrothiophene (THT) complex (C.-I. Brändén, Ark. Kemi, 1964, 22, 495-500). The structures can be described either as comprised of [HgX$_2$·THS$_J$, THJ$^-$ and Cl$^-$] anions or as built up of polymeric helogen-bridged double chains. The same arrangement is also found in HgCl$_2$·2THSe and HgBr$_2$·2THSe, (M. Nowell, Inorg. Chim. Acta, 1981, 51, 185-189). The Hg-atoms have distorted trigonal bipyramidal environments in these compounds.

The two compounds are built up of isolated mononuclear pseudotetrahedral molecules [Hg(THSe)$_2$]$^{+}$ (X = Br, I) of approximately C$_2v$ point symmetry. The Br-Hg-Br and Se-Hg-Se angles are 110.1 and 114.8° in HgBr$_2$·2THSe, corresponding angles in HgI$_2$·2THSe are 120.8 and 109.0°. Similar discrete tetrahedral complexes are found in the compounds HgCl$_2$·2THT and HgBr$_2$·2THT (M. Sandström and I. Persson, in preparation) and also in HgBr$_2$(py)$_2$ and HgI$_2$(py)$_2$ (A.J. Canty, C.L. Reston, S.W. Skeleton and A.H. White, J. Chem. Soc., Dalton Trans., 1982, 15-18).