Electronic supplementary information

Mercury thioarsenate glasses: a hybrid chain/pyramidal network

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Table S1 Conductivity parameters for the HgS-As2S3 glasses: the room-temperature conductivity $\sigma_{298}$, the activation energy $E_\sigma$, and the pre-exponential factor $\sigma_0$

<table>
<thead>
<tr>
<th>HgS concentration (mol.%)</th>
<th>log $\sigma_{298}$ (S cm$^{-1}$)</th>
<th>$E_\sigma$ (eV)</th>
<th>log $\sigma_0$ (S cm$^{-1}$ K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>-15.41 (2)</td>
<td>0.972 (10)</td>
<td>3.45 (12)</td>
</tr>
<tr>
<td>20</td>
<td>-15.74 (6)</td>
<td>1.081 (20)</td>
<td>4.95 (24)</td>
</tr>
<tr>
<td>30</td>
<td>-16.56 (3)</td>
<td>1.184 (10)</td>
<td>5.86 (24)</td>
</tr>
<tr>
<td>40</td>
<td>-16.12 (5)</td>
<td>1.105 (15)</td>
<td>4.99 (18)</td>
</tr>
<tr>
<td>50*</td>
<td>-15.65 (4)</td>
<td>1.051 (14)</td>
<td>4.54 (18)</td>
</tr>
</tbody>
</table>

Uncertainties in the last digit(s) of the parameter are given in parentheses

* glassy/crystalline sample
Fig. S1 (a) Typical raw Raman spectra of the (HgS)$_x$(As$_2$S$_3$)$_{1-x}$ glasses taking the $x = 0.1$ sample as an example. The spectral background over the 200-600 cm$^{-1}$ range was approximated by a Voigt function (dashed line). (b) The resulting Raman spectrum for the $x = 0.1$ glass after background subtraction and normalisation to the most intense spectral feature at 340 cm$^{-1}$. 
Supplementary movies

Supplementary movie SM1

Symmetric in-phase Hg-S stretching in Hg$_2$S$_3$H$_2$ oligomer at 306 cm$^{-1}$
Supplementary movie SM2
Symmetric out-of-phase Hg-S stretching in Hg_S_3H_2 oligomer at 325 cm^{-1}
Supplementary movie SM3
Asymmetric in-phase Hg-S stretching in Hg$_2$S$_3$H$_2$ oligomer at 355 cm$^{-1}$