

## Supplementary Information

The information on calculations of functions  $A(\omega)$ ,  $Im(\Sigma)$ ,  $G^{-1}(\omega)$  and  $A_{tot}(\omega)$  for all studied structures is given below. The figures are arranged as follows. On the upper graphs solid lines represent spectral functions  $A(\omega)$  for bottom valence electron state, dotted lines represent  $Im(\Sigma)$  for bottom valence electron state, dashed lines represent  $G^{-1}(\omega)$  for bottom valence electron state. The lower graphs represent spectral functions  $A_{tot}(\omega)$  summarized over all valence electron states. For the structures  $Si_{54}H_{50}$  and  $Si_{64}H_{56}$  only functions  $A(\omega)$ ,  $Im(\Sigma)$  and  $G^{-1}(\omega)$  for bottom valence electron states are given.

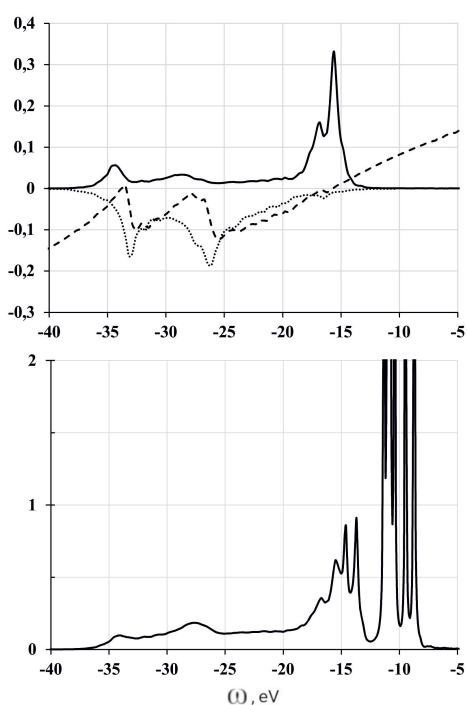


Figure 1:  $Si_3H_8$  nanocluster

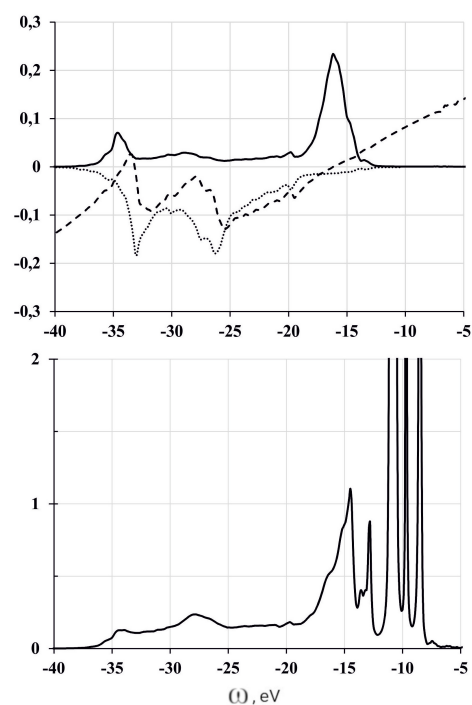


Figure 2:  $Si_4H_{10}$  nanocluster

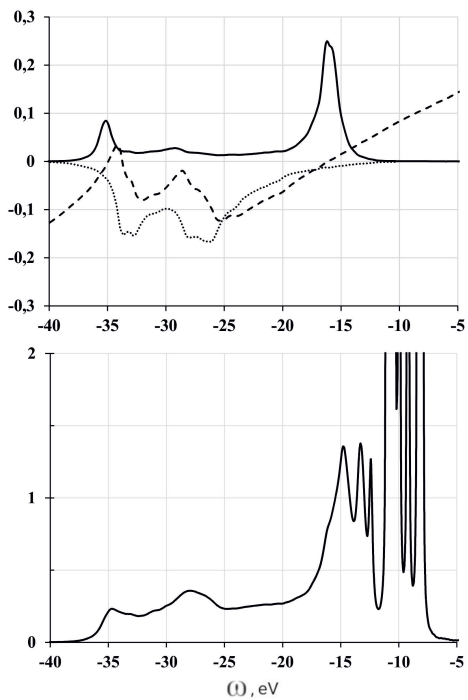


Figure 3:  $\text{Si}_7\text{H}_{14}$  compact isomer

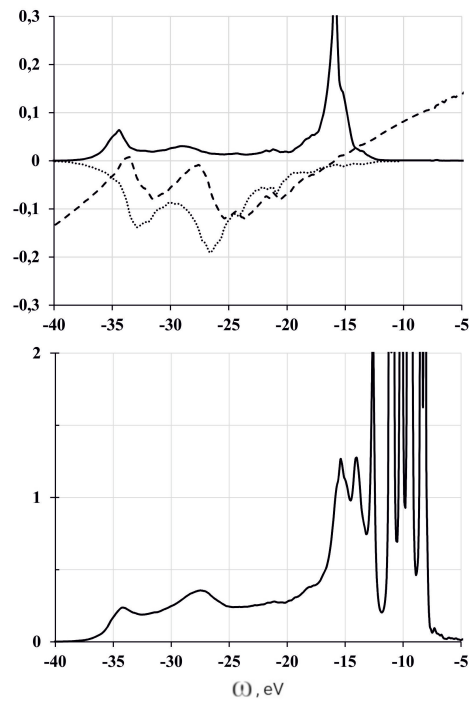


Figure 4:  $\text{Si}_7\text{H}_{14}$  ring isomer

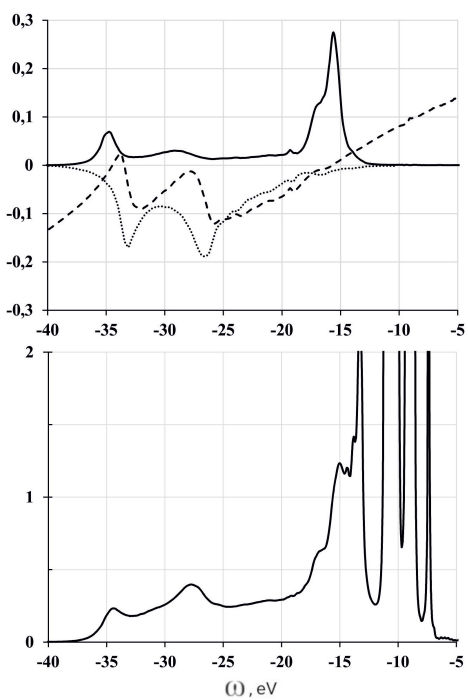


Figure 5:  $\text{Si}_7\text{H}_{16}$  nanocluster

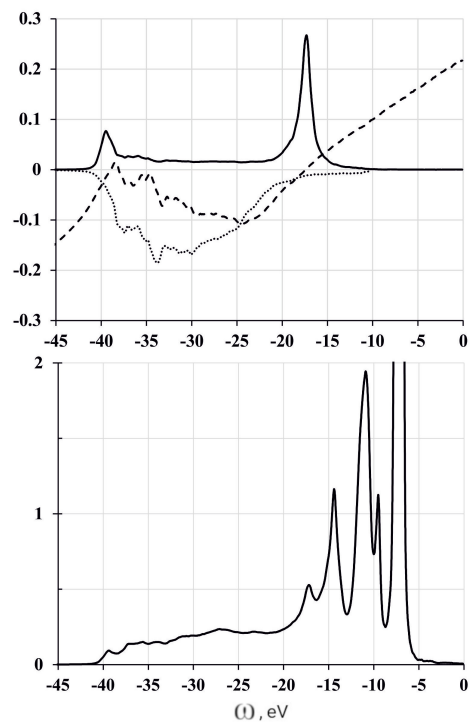


Figure 6:  $\text{Si}_{10}$  nanocluster

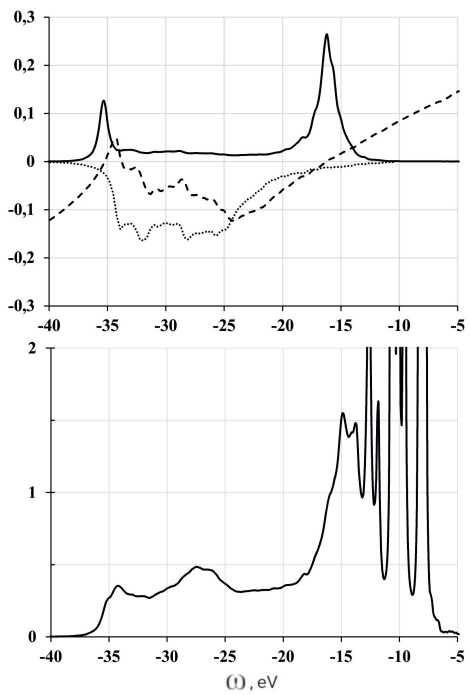


Figure 7:  $\text{Si}_{10}\text{H}_{16}$  nanocluster

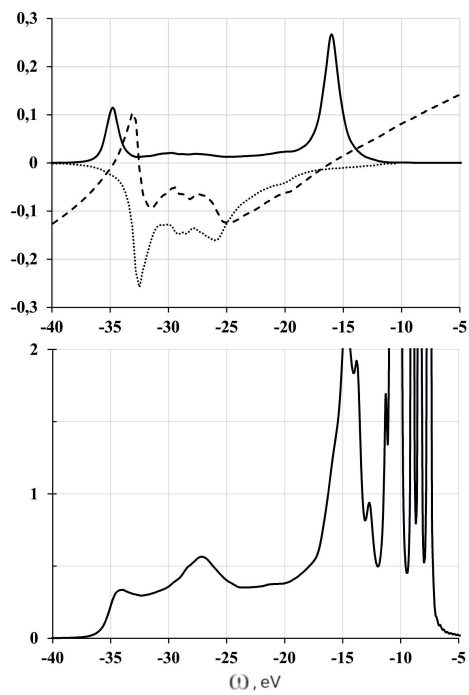


Figure 8:  $\text{Si}_{10}\text{H}_{22}$  nanocluster

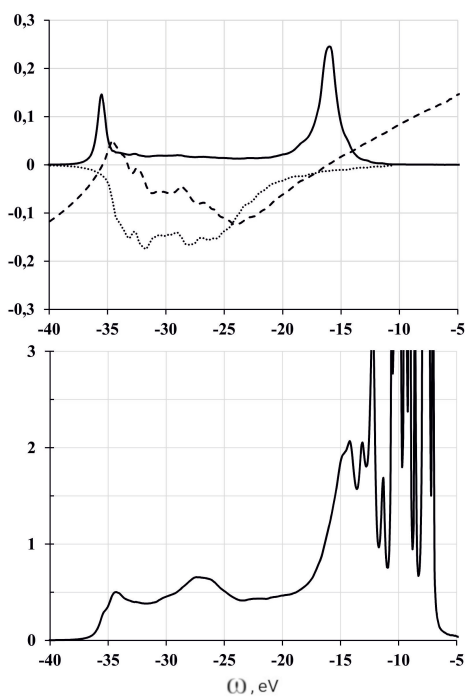


Figure 9:  $\text{Si}_{14}\text{H}_{20}$  nanocluster

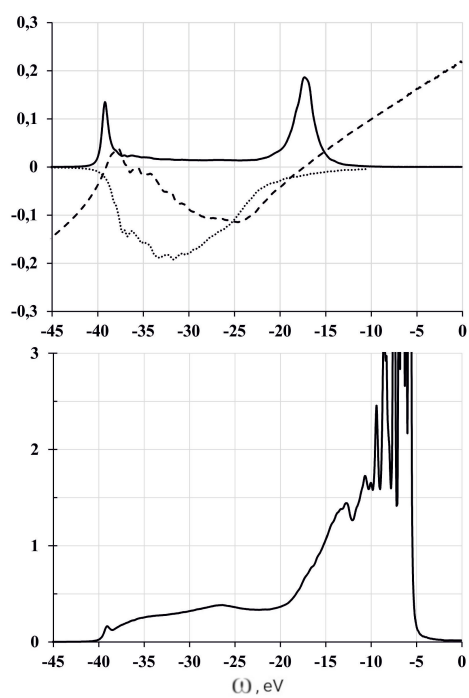


Figure 10:  $\text{Si}_{16}$  nanocluster

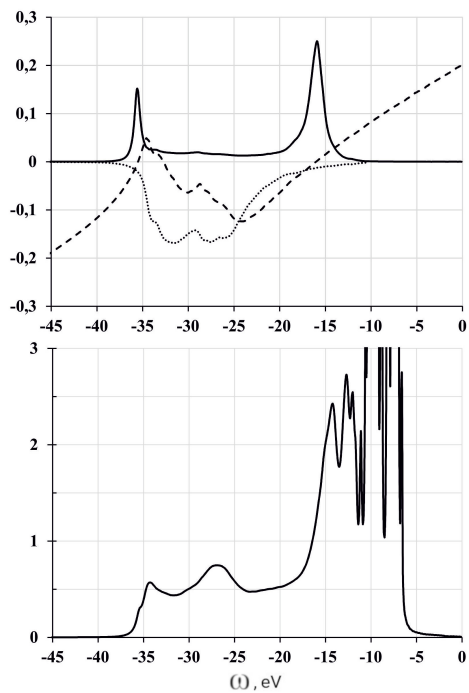


Figure 11:  $\text{Si}_{16}\text{H}_{22}$  nanocluster

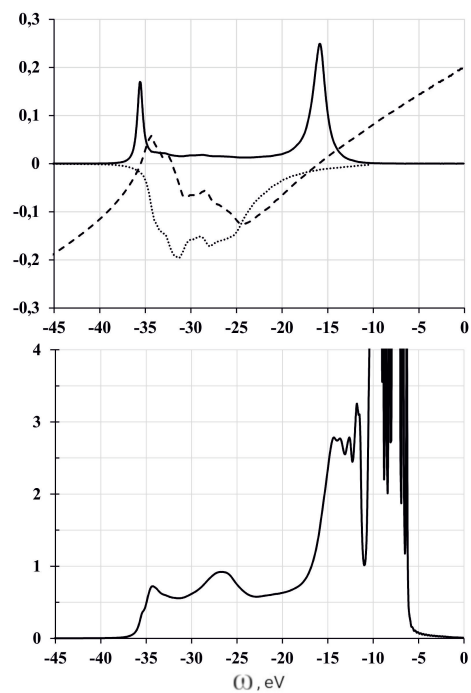


Figure 12:  $\text{Si}_{20}\text{H}_{26}$  nanocluster

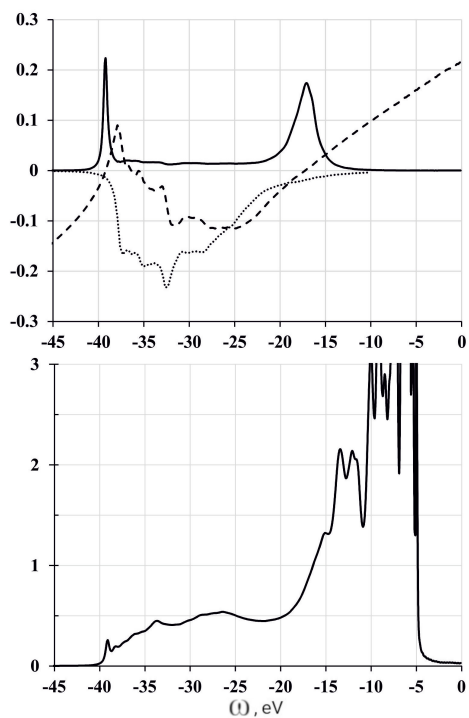


Figure 13:  $\text{Si}_{22}$  nanocluster

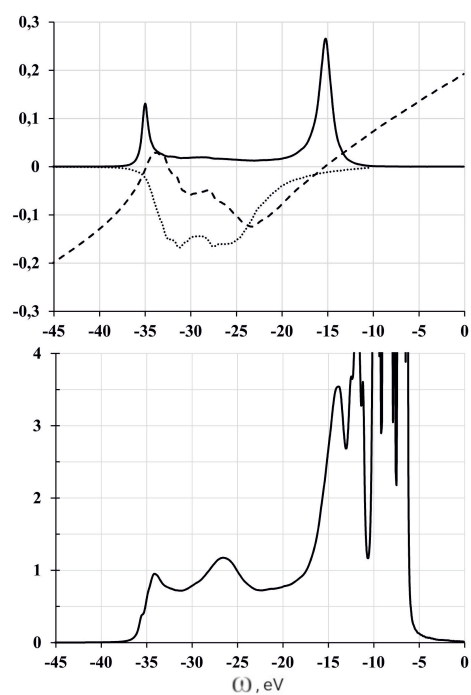


Figure 14:  $\text{Si}_{26}\text{H}_{30}$  nanocluster

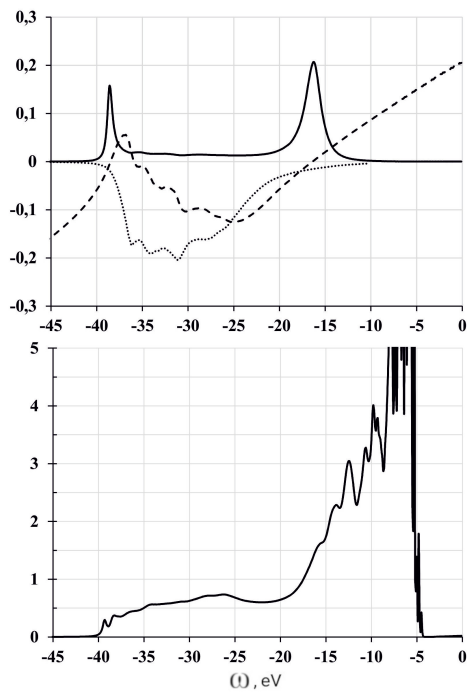


Figure 15:  $\text{Si}_{30}$  nanocluster

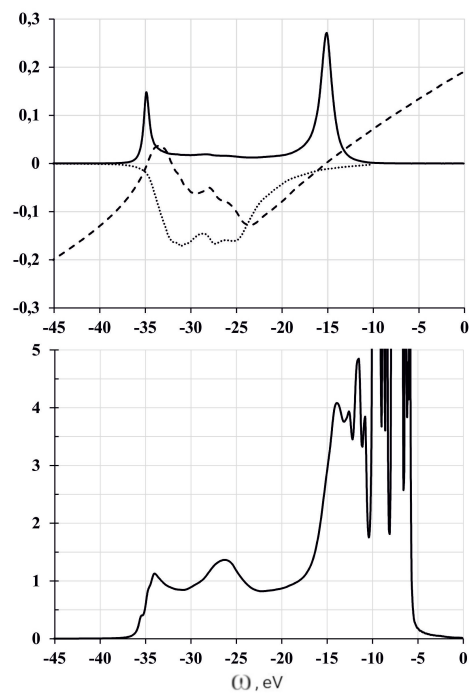


Figure 16:  $\text{Si}_{30}\text{H}_{34}$  nanocluster

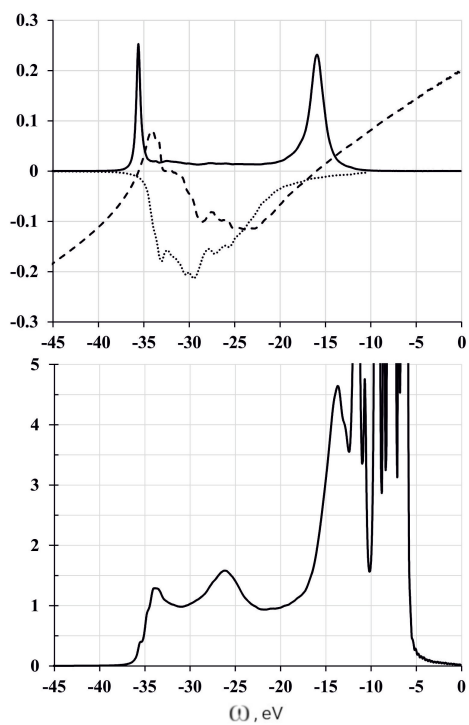


Figure 17:  $\text{Si}_{35}\text{H}_{36}$  nanocluster

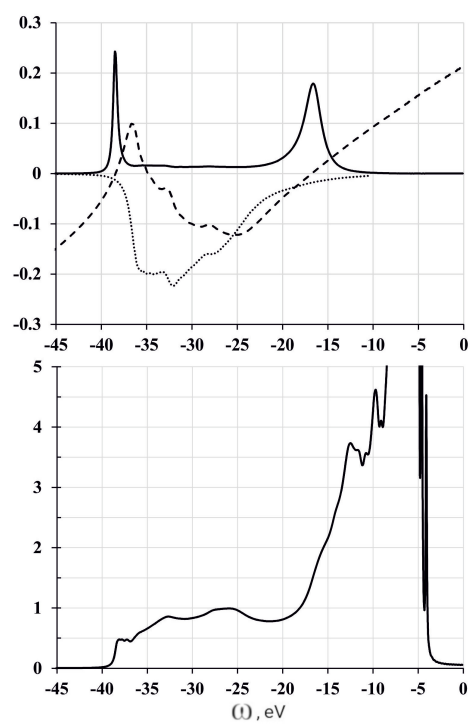


Figure 18:  $\text{Si}_{39}$  nanocluster

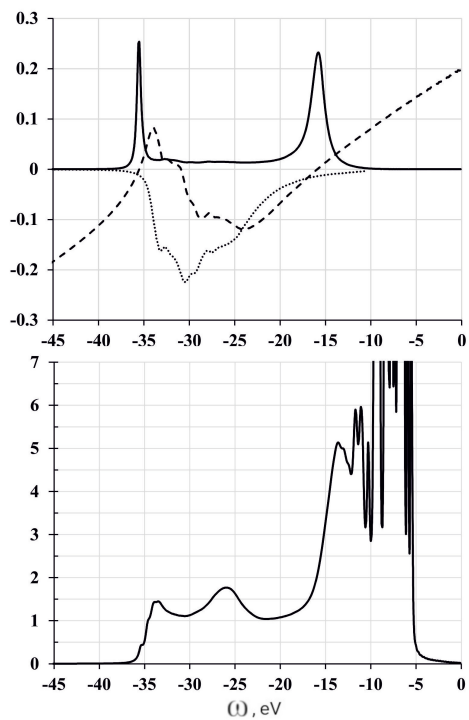


Figure 19:  $\text{Si}_{39}\text{H}_{40}$  nanocluster

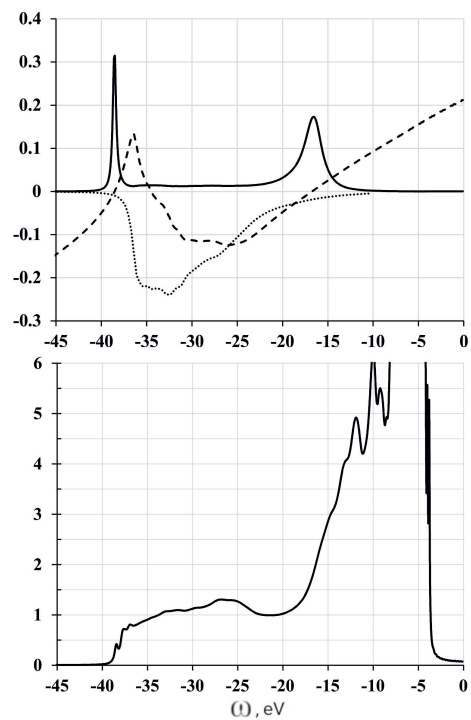


Figure 20:  $\text{Si}_{51}$  nanocluster

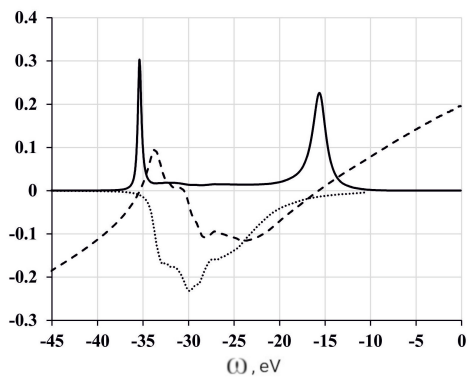


Figure 21:  $\text{Si}_{54}\text{H}_{50}$  nanocluster

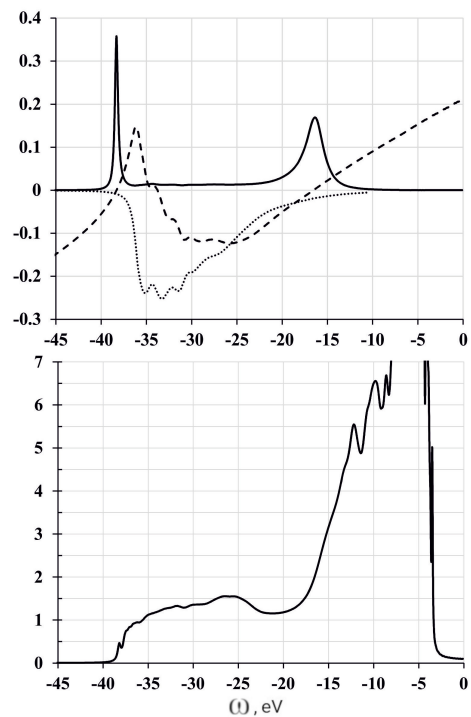


Figure 22:  $\text{Si}_{60}$  nanocluster

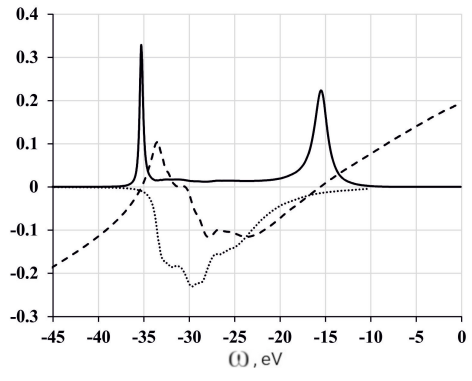


Figure 23:  $\text{Si}_{64}\text{H}_{56}$  nanocluster