

**Thin films of chlorosubstituted vanadyl phthalocyanine:  
charge transport properties and optical spectroscopy  
study of structure**

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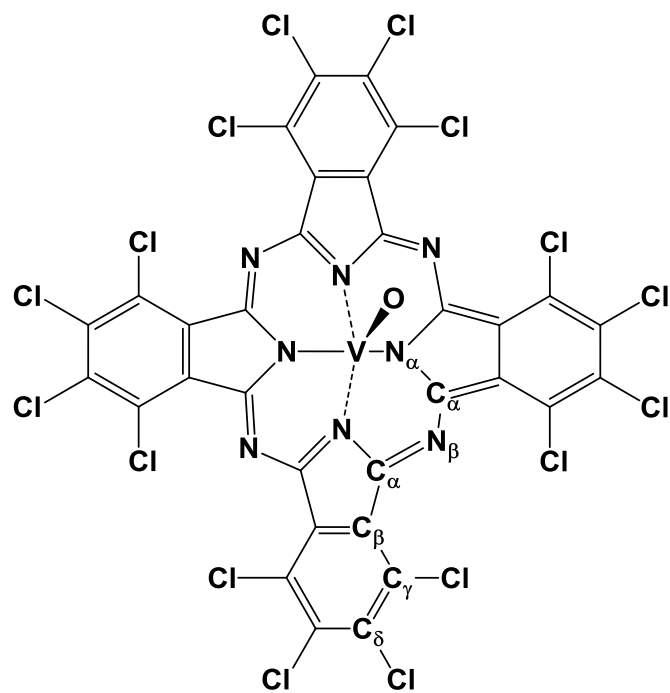
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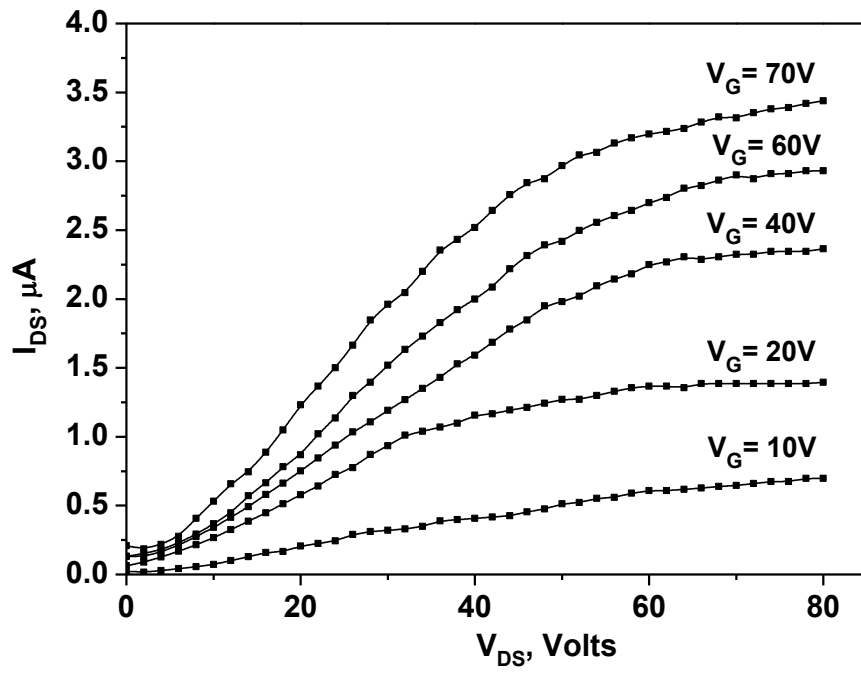
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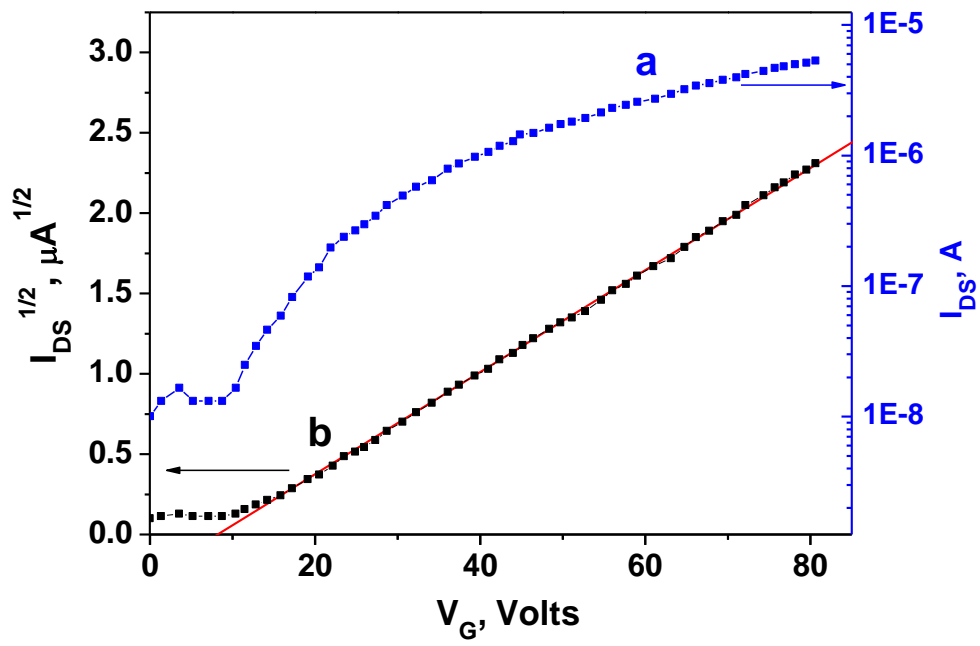
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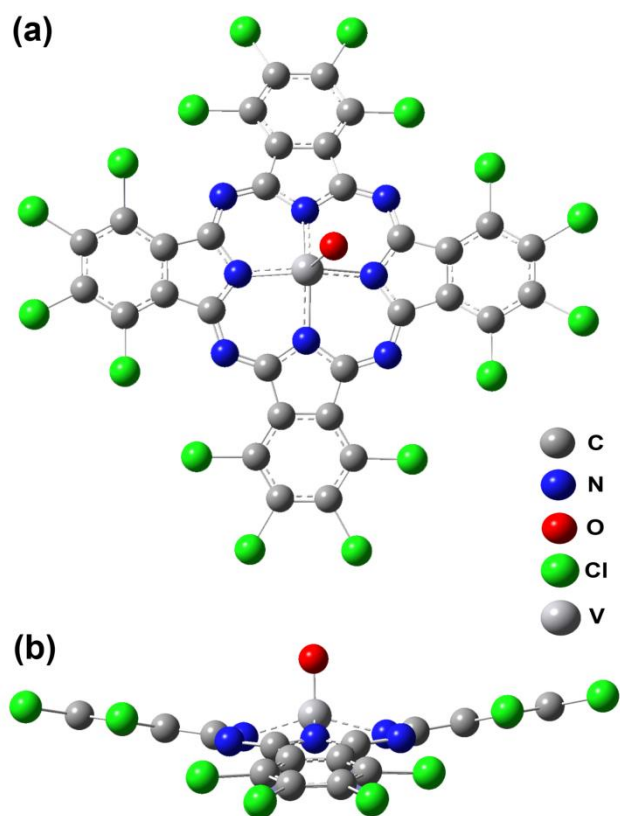
**Figure 1.** Structure of VOPcCl<sub>16</sub> molecule.



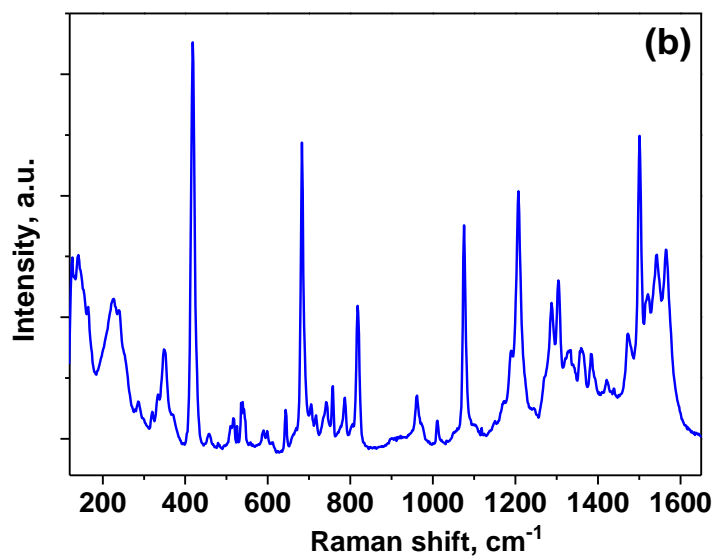
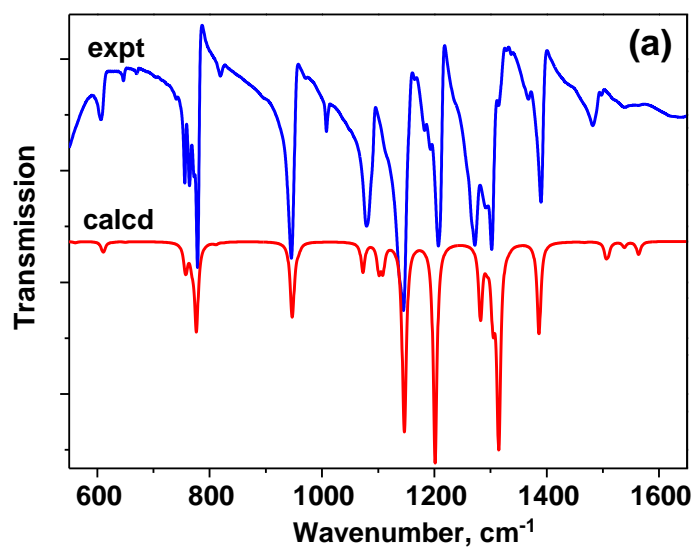
**Figure 2.** The source-drain current ( $I_{DS}$ ) as a function of drain-source voltage ( $V_{DS}$ ) characteristics of field effect transistor based on VOPcCl<sub>16</sub> film at various source-gate voltage values ( $V_G$ ). The experimental points are black squares connected with splines to visualize trends.



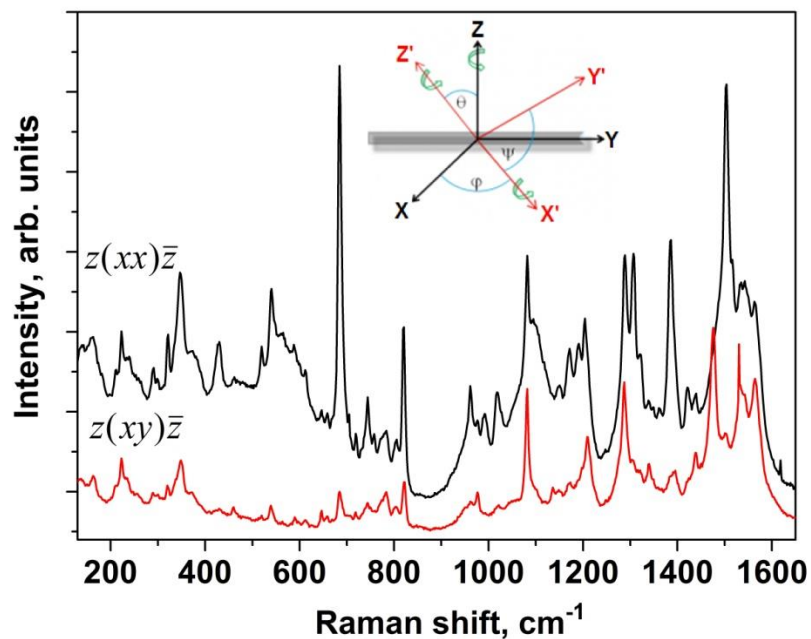
**Figure 3.** (a) The transfer curves  $I_{DS}$  versus  $V_{GS}$  for a field effect transistor based on VOPcCl<sub>16</sub> film at  $V_{DS} = 80V$ . (b)  $\sqrt{I_{DS}}$  versus  $V_{GS}$  for a fixed drain-source voltage of 80 V in the saturation regime.



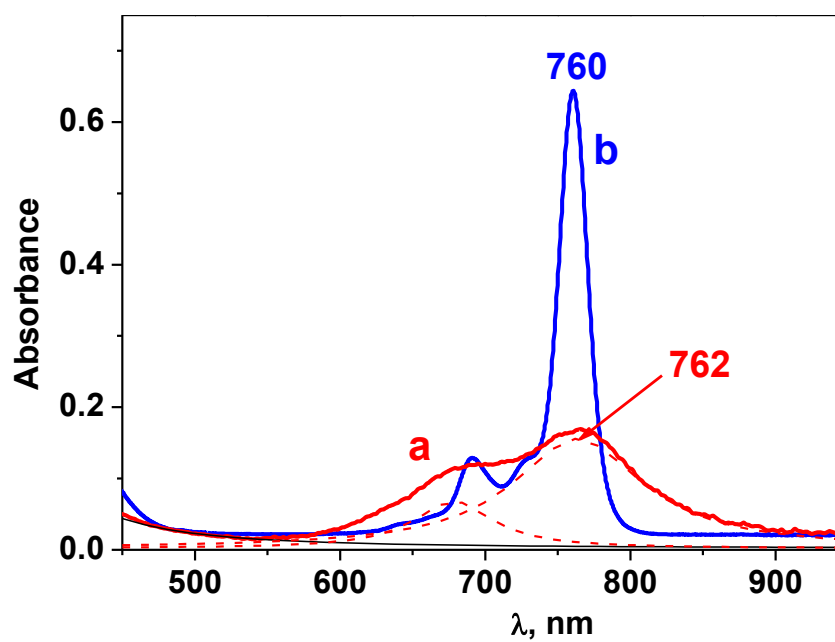
**Figure 4.** B3LYP/6-311++G(2df,p) optimized structure of the VOPcCl<sub>16</sub> molecule: (a) top view; (b) side view.



**Figure 5.** (a) IR spectra of VOPcCl<sub>16</sub>: experimental (blue graphic) and B3LYP/6-311++G(2df,p) calculated (red graphic); (b) Experimental Raman spectrum of VOPcCl<sub>16</sub>.



**Figure 6.** Polarized Raman spectra of VOPcCl<sub>16</sub> film (glass substrate), recorded in the parallel ( $z(xx)\bar{z}$ ) and cross ( $z(xy)\bar{z}$ ) polarizations of the incident and scattered light. The inset illustrates the coordinate notation: the Euler angles  $\phi$ ,  $\theta$  (which is the tilt angle between Z and Z'), and  $\psi$  correspond to rotations around the Z-axis of a substrate, the molecular X'-axis, and around the Z'-axis of a molecule, respectively.



**Figure 7.** The UV-vis absorption spectra of VOPcCl<sub>16</sub> in the thin film (a, red graphic) and its Lorentzian band fit (red dotted lines) as well as the spectra in solution (10<sup>-5</sup> M) of 1-chloronaphthalene (b, blue graphic).