Temperature dependence of aqueous two-phase extraction of single-walled carbon nanotubes

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Single-walled carbon nanotubes (SWCNTs) are considered as one of the most promising nanomaterials because of their extraordinary mechanical, thermal and electrical properties. SWCNTs have an exceptional feature that they can be either metallic or semiconducting with varying band gaps, depending on their diameter and chirality. Semiconducting single-walled carbon nanotubes can be useful for photonic device applications, while metallic are particularly promising for a variety of electronic applications such as nanocircuit components [1]. Most of the currently known SWCNT synthetic techniques produce SWCNTs in a mixture of both types of conductivities. Therefore, the problem of extraction either semiconducting or metallic SWNTs becomes important. In this work, we considered a spontaneous partition of SWCNTs in polymer-modified aqueous phases [2,3] and studied the temperature dependence of metallic/semiconductor separation of SWCNTs.

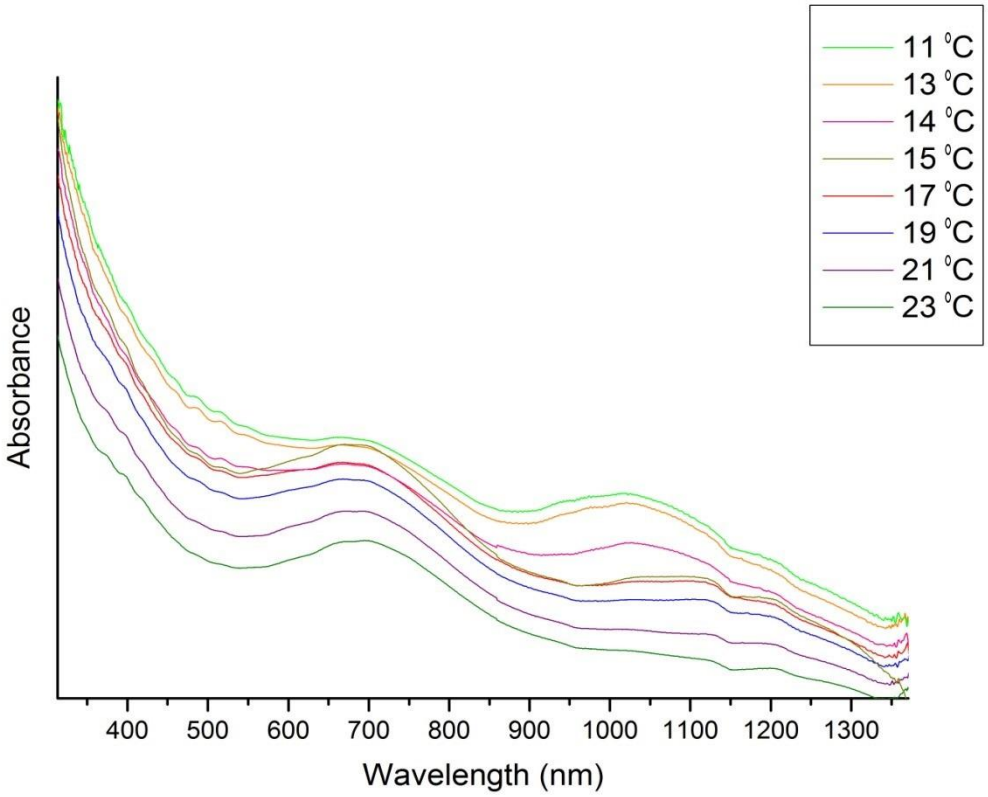

Fig. 1. UV-vis-NIR absorption spectra from the bottom (metallic) phase depending on the temperature.

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References

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