

# Accepted Manuscript

Negative infrared bands—A new phenomenon in the vibrational spectroscopy of water oligomers

Edward M. Kosower



PII: S1386-1425(18)30675-9  
DOI: [doi:10.1016/j.saa.2018.07.022](https://doi.org/10.1016/j.saa.2018.07.022)  
Reference: SAA 16291

To appear in: *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*

Received date: 20 April 2018

Revised date: 16 June 2018

Accepted date: 8 July 2018

Please cite this article as: Edward M. Kosower , Negative infrared bands—A new phenomenon in the vibrational spectroscopy of water oligomers. Saa (2018), doi:[10.1016/j.saa.2018.07.022](https://doi.org/10.1016/j.saa.2018.07.022)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Negative Infrared Bands – A New Phenomenon in the Vibrational Spectroscopy of Water Oligomers

By Edward M. Kosower\*

School of Chemistry, Tel Aviv University, Tel Aviv 69978 Israel

\*Inquiries may be addressed to [kosower@post.tau.ac.il](mailto:kosower@post.tau.ac.il)

### Abstract

Infrared spectra of small amounts of water on the "hydrophobic" polymers, polyethylene (PE), polypropylene (PP) and polytetrafluoroethylene (PTFE), include many negative infrared bands that become positive with increasing temperature. The new species that the bands represent must arise through absorption of the incident radiation to form short-lived femtosecond states that disappear by (a) induced (Einstein) emission, thus leading to negative IR bands, or (b) fragmentation with loss of vibrational energy or (c) are replaced by an infrared excited state. In addition, we must note that polyethylene, polypropylene and polytetrafluoroethylene carry water! and many water oligomers (chair, boat, and prism hexamer) are easily observed.

### Keywords

Negative IR absorption bands; Hydrophobic surfaces; Water; Thin films

Download English Version:

<https://daneshyari.com/en/article/7667197>

Download Persian Version:

<https://daneshyari.com/article/7667197>

[Daneshyari.com](https://daneshyari.com)