

Abstract Submitted
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Identification of atomic constituents in medicines using spectral analysis¹ JOHN PICKREN, KEELEY TOWNLEY-SMITH, Department of Physics, Lamar University, AZAM NURUL, CRISTIAN BAHRIM, Department of Physics and EE, Lamar University — We are interested to identify the composition of several over-the-counter medicines, including their impurities. For that we analyze the emission spectra of medicines sprayed or scattered in flames using a portable Ocean Optics RedTide USB650 spectrometer with an optical resolution of 0.6 nm and a GLX Xplorer. We compare our emission spectra with reliable spectroscopic databases including optical transitions, transition probabilities, and Grotrian diagrams. In addition to the basic composition of selected medicines we can identify traces of impurities as weak emission lines. We observed similar optical patterns in medicines which serve different purposes, such as Mucinex and Theraflu. For a group of medicines, such as Tylenol and calcium supplements, we have found that surprisingly, stronger emission lines of sodium and potassium than of Calcium. Our purpose is to classify the medicines based on their light pattern and generate characteristic spectra for medicines used in the treatment of similar diseases. Our optical results can be compared with the chemical patterns from chemical reactions. We study medicines in flames also for the purpose of developing an optical method for analyzing pollutants released from industrial flare towers.

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Cristian Bahrim
Department of Physics, Lamar University

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