FORMULATION ANALYSES OF COMMON HEALTH SUPPLEMENTS

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Dietary health supplements were analyzed to determine the effectiveness of the PDF-4 Organics database in analyzing multi-component formulations of common materials. Fourteen different tableted formulations were analyzed that represented thirteen of the top 20 selling health supplements by dollar sales.

The health supplements were primary composed of two groups, multivitamins and herbal supplements. The multivitamins, as a group, are an interesting challenge due to the large number of active ingredients and the blend of excipients, minerals and vitamins found in a typical tablet. High resolution data from a PANalytical X'Pert Pro Alpha One system were used to deconvolute the overlapping patterns of these multi-phase compositions. Overall, several ingredients were found common to multivitamin formulations such as ascorbic acid, calcite, zincite, and sylvite as sources for vitamin C, calcium, zinc, and potassium respectively. Additional ingredients differentiated between, normal, children's and senior multi-vitamins. Calcium hydrogen phosphate was a common formulation excipient, however, both anhydrous and hydrated forms were found in many formulations. Some multi-vitamin data sets were also taken on the synchrotron at Argonne National Laboratory for comparison of phase identification and quantitation sensitivity.

The herbal supplements offered a dramatic contrast to the multivitamins. Since herbals are frequently an extract of root, leaf, and other plant materials the chemistry of cellulose is a common denominator. In these sample the challenge was in the identification of poorly crystalline or semi-crystalline phases from the cellulose family. Using the digital pattern calculation capability in PDF-4 Organics with DDView+ reference patterns with small crystallite sizes were generated to match with the experimental data. Data will be presented on the analyses of Echinacea, Melatonin, St. John's Wort and Saw Palmetto.