

Abstract Submitted
for the TSF13 Meeting of
The American Physical Society

X-ray Diffraction Study of Acetaminophen VICTOR GONZALEZ, LEONEL GRIEGO, ANDRES ENCERRADO, CRISTIAN BOTEZ, The University of Texas at El Paso — Acetaminophen is one of the most common active ingredients in pharmaceutical products. Its crystal structure might change if it is not stored correctly. We analyzed the crystal structure of acetaminophen to observe if it changes upon heating. Pharmaceutical products usually need to be stored carefully, which includes keeping them in a dry and cool place. If acetaminophen were to be exposed to high temperatures when stored improperly, its crystalline structure may be affected; therefore, changing its biological properties. We prepared our powder samples by crushing two 500mg tablets of Equate® and collected diffraction data on a Siemens® D5000 X-ray diffractometer at temperatures between 25°C and 165°C. We analyzed each data set by carrying out full-profile (Le Bail) refinements starting with the known room-temperature lattice parameters $a=11.72$ $b=9.379$ $c=7.106$ $th=97.472$, and space group $p2_1/n$ of acetaminophen. Our data and analysis reveal that the lattice parameters vary smoothly within the 25 – 165°C temperature interval, which indicates that no polymorphic phase transitions occur. Further heating above 165°C leads to the thermal decomposition of the active ingredient.

Andres Encerrado
The University of Texas at El Paso

Date submitted: 12 Sep 2013

Electronic form version 1.4