BROAD-SPECTRUM ANTIBIOTIC GLASSES CHARACTERIZATION AND PURSUING TUNABLE SOLUBILITY

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WHAT ARE WE WORKING WITH?

Pdda, I. S. Cef.  
Structure and pertaining information

- Purple = sodium
- Gray = carbon
- Red = oxygen
- Yellow = sulfur
- Cyan = nitrogen

Possibilities for hypercoordination by small O-bearing solvents during crystallization
Background

* Applications

Formulation

* Drug delivery – drug stability

* Involves leaving solvent systems and drug systems at room temperature
Powder X-Ray Diffraction (PXRD)

Key Takeaways:
- Drug itself is crystalline
- Glasses, even after milling, are amorphous (blobby and broad, no crystalline order)
Key Takeaways:
- Suggests $T_g$ which points to glass
- The drug does not display this independently

Differential Scanning Calorimetry (DSC)
**Proton Nuclear Magnetic Resonance (1H NMR)**

**Key Takeaways:**
- Compound X is not changing (or changing very minimally) when placed into the glass and re-dissolved.

Visual Test

Key Takeaways:
- Sample doesn’t appear to be degrading when left in light for prolonged periods
Preliminary IR (Infrared) Data

Key Takeaways:
- Compound X is not changing (or changing very minimally) when placed into the glass AND annealed

CONCLUSIONS AND FUTURE WORK

→ Apply for beam time at NIST!

→ Perform HPLC (High-Performance Liquid Chromatography)

→ Perform IR and Raman on everything

→ Optical properties

→ Mill for different lengths of time to determine where re-crystallization occurs

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Questions?