Quality by Design Scope of Work Tool for APIs

Background Information

1. Why is the experimental study being performed?

    a. What question is to be answered by the study?

    b. Why is this question important within the context of the overall research program?

2. What is the maximum scale at which the API has been produced?

3. What are the known vulnerabilities of the API synthetic process?

Experimental Factors

1. What are the experimental factors (inputs) that are proposed for this study (e.g., raw material characteristics, time, temperature, stoichiometry, agitation rate/type, concentration, equipment, etc.)?

2. What is currently known about these factors?

    a. What are the current setpoints for these factors?

    b. What are the proven acceptable ranges for these factors?

    c. What setpoint values have resulted in failures? What specific process or product attribute failures were observed in these cases?

3. What is known about the effect of moisture upon the process / product?

Experimental Responses

1. What are the experimental responses (outputs) that are proposed for this study (e.g., assay, chromatographic purity, related substances levels, total impurities, yield, stability, labor and material costs, polymorphic form, particle size distribution, etc.)?

2. What measurements are being performed to assess these responses?

3. What is the inherent variability in the measurement of the response(s)?

Resolution

1. What level of resolution is required in the study?

    a. Critical Process Parameter Screening Level (Resolution III, estimation of main effects, identification of confounded two-way interactions)

    b. Process Design Space Level (Resolution IV, estimation of main effects, and all two-way interactions)

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      c. Process Optimization Level (Resolution V, estimation of all main effects, interactions, and a detailed assessment of the response surface within the design space)

Timeline and Budget

1. What is the timeline for completion of the study?

2. How long does each individual run take to perform?

3. What is the overall budget for performing this work?