

Day 1 Homework Exercises

Double your impact by getting started with
Design of Experiments (DoE)



Day 1 Homework Exercise

Do you remember impact you've gotten started with Design of Experiments (DoE)?

~~Experiment one-factor-at-a-time~~

Questions:

1. How does each factor affect the response, Yield?
2. What are the best settings of the factors to maximise Yield?
3. How many runs do you need to conduct to meet your objectives?

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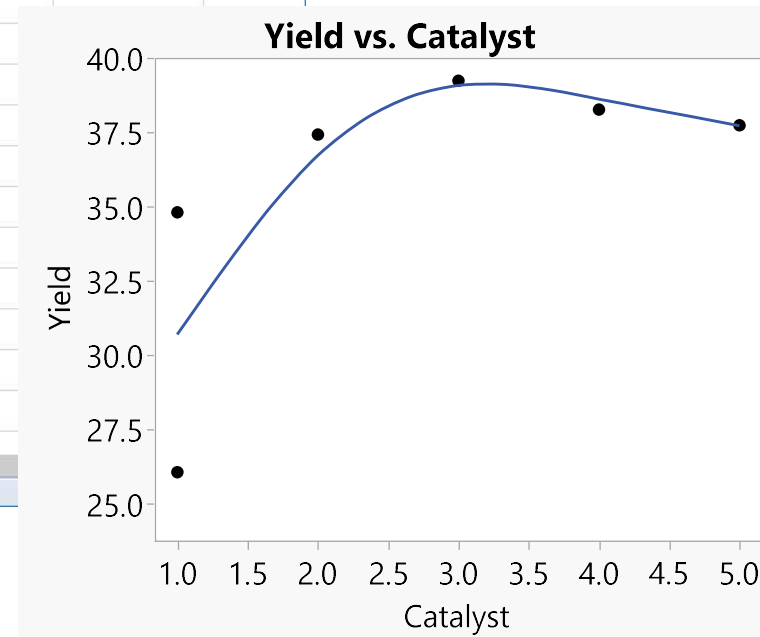
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Experiment one-factor-at-a-time

The screenshot shows the JMP Pro interface for a 'Heck Reaction OFAT' experiment. The data table is as follows:

	Volume	Catalyst	Temperature	Time	Sodium Acetate	Yield
1	1.5	1	50	4	1.5	26.0384983
2	10	5	120	24	4	37.7224787
3	10	4	120	24	4	38.2527456
4	10	3	120	24	4	39.2239579
5	10	2	120	24	4	37.4081982
6	10	1	120	24	4	.

The interface also shows a sidebar with 'Columns (6/0)' including Volume, Catalyst, Temperature, Time, Sodium Acetate, and Yield. The 'Rows' section shows 6 total rows, with 0 selected, 0 excluded, 0 hidden, and 0 labelled.



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Smarter Experimentation For Chemists

Experiment one-factor-at-a-time

Solutions:

There are no definitive answers for this exercise.

The important learning outcome is that experimenting in this way is open-ended, inefficient and ineffective.

You will most likely have found that with OFAT experimentation it is very difficult to meet your aims, or even to know whether you have.

In later lessons and exercises you will see how you can learn more effectively and efficiently using designed experiments.