Title: A Green Chemistry Revolution: Transformation with Sustainable Heating

Team Members: Taehee Kim, San Pham, Nyasha Musoni, Daniel Sebisaho, Alexandra Ikegami

Amount awarded: $4,225

Total amount spent: $ 2,279.52

Description of the project:

Our laboratory faces a unique set of challenges stemming from its age, including outdated and inefficient equipment and practices. Many of our reactions necessitate the use of energy-inefficient heating mantels, hot plates, and oil baths. Oil baths, aside from their inherent safety hazards, contribute to excessive waste generation due to frequent replacements to avert fire and burn hazards from splattering. Moreover, these procedures entail the use of aging, non-energy-efficient hot plates that are at least a decade old. The use of alternative practices and equipment in our lab is a pivotal step towards steering our lab onto a sustainable trajectory.

Our initial step involves obtaining modern, energy-efficient stirring hot plates, replacing our old stirring hot plates with the Super-Nuova+ Series Hot Plates and Stirrers. These cutting-edge hot plates not only provide superior heating control for our reactions but also feature an integrated timer function, allowing us to conserve energy by automatically shutting off after a predefined time. Additionally, we aim to procure heating blocks to complement the hot plates, enabling us to conduct multiple reactions simultaneously on a single hot plate. Our existing setup restricts us to only a single round-bottom flask or two 5-mL vials per hot plate due to the need for multiple ring clamps needed to hold each reaction vessel. By introducing heating blocks, we can accommodate more reactions on a single hot plate while ensuring uniform heating of a set amount of time.

These small heating changes and new behaviors can make a large stride towards revolutionizing our aged laboratory space bringing it into the 21st century.

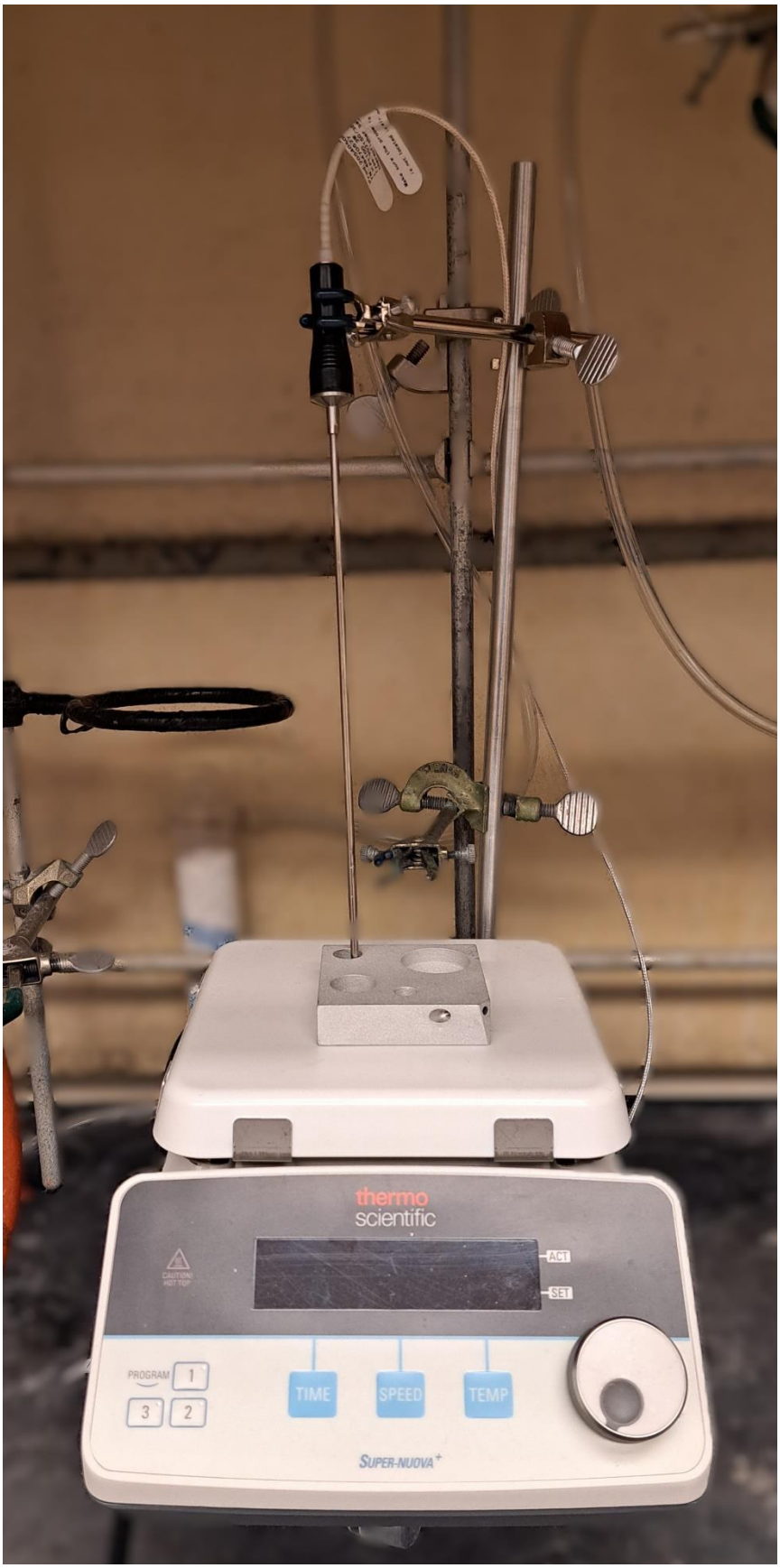
Objective:

Our primary objective in revitalizing our lab is to supplant these outdated and energy-draining heating methods and equipment with environmentally conscious alternatives.

Results:

Our lab purchased the Super-Nuova hot plates and stirrers along with a few heating blocks that fit round bottom flask and vials. These changes were part of the first step in lowering energy consumption in our lab. We were able to increase the reaction throughput by setting up multiple reactions at one; thereby, decreasing the amount of energy needed to run these reactions at different times. Additionally, heating blocks are essentially safer than the traditional oil baths. After switching to heating blocks, we reduced the risk of fire by spilling the oil baths.

Photos:


thermo
scientific
ACT
SET
PROGRAM
1
2
3
TIME
SPEED
TEMP
SUPER-NUOVA+