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Wastewater Denitrification Using BHN-Probiotic Solutions as an Alternative External Carbon Source

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Background



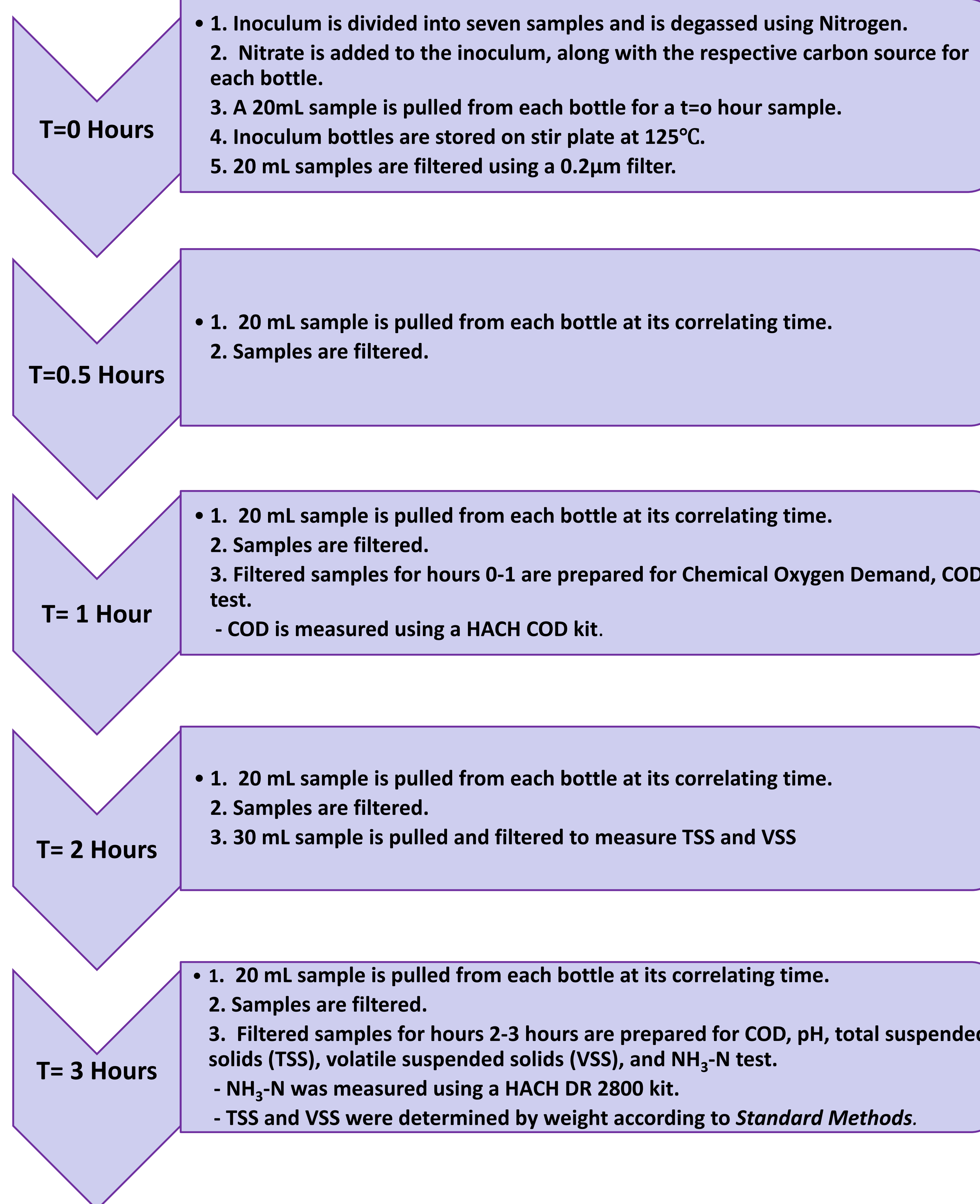
Reducing the amount of Nitrate found in wastewater is a crucial step for wastewater treatment plants, and denitrification is an essential biological step that could be rate-limiting. To reach the stringent nutrient discharge standards, treatment plants commonly use methanol as an external carbon source; however, there are many safety issues that can arise from using methanol. This problem prompted the study to find and compare other sustainable and environmentally-friendly carbon sources that could potentially be used by wastewater treatment plants as a replacement for methanol, while still maintaining low nitrogen levels. For this study five different carbon sources were evaluated: MicroC, methanol, acetate, product 201 and 203 from BHN – Probiotic Solutions®.

Objective

To compare the denitrification kinetics and rates of BHN-Probiotic Solutions to those of Methanol and Micro C.

Methods

Denitrification Tests



Results

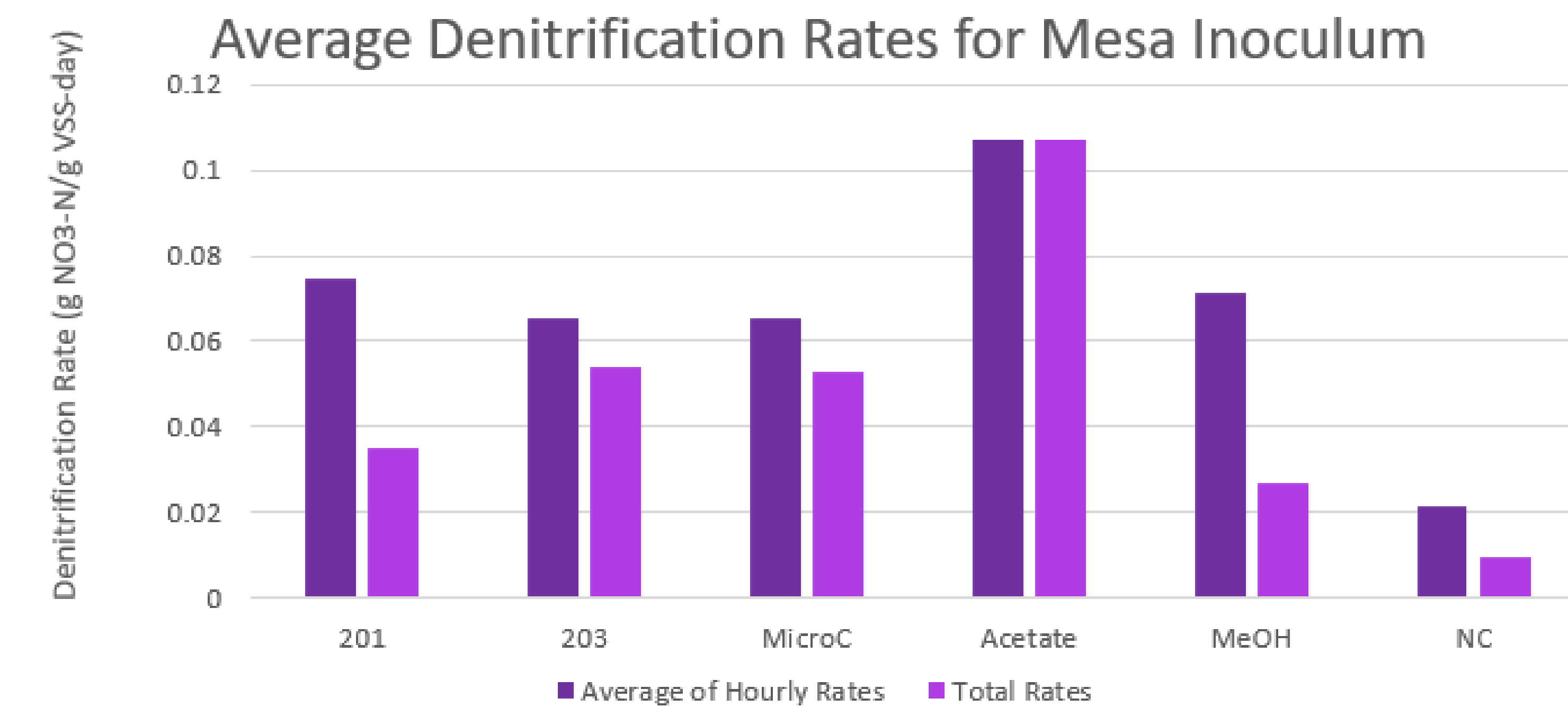


Figure 6. Average Specific Denitro Rates for Mesa

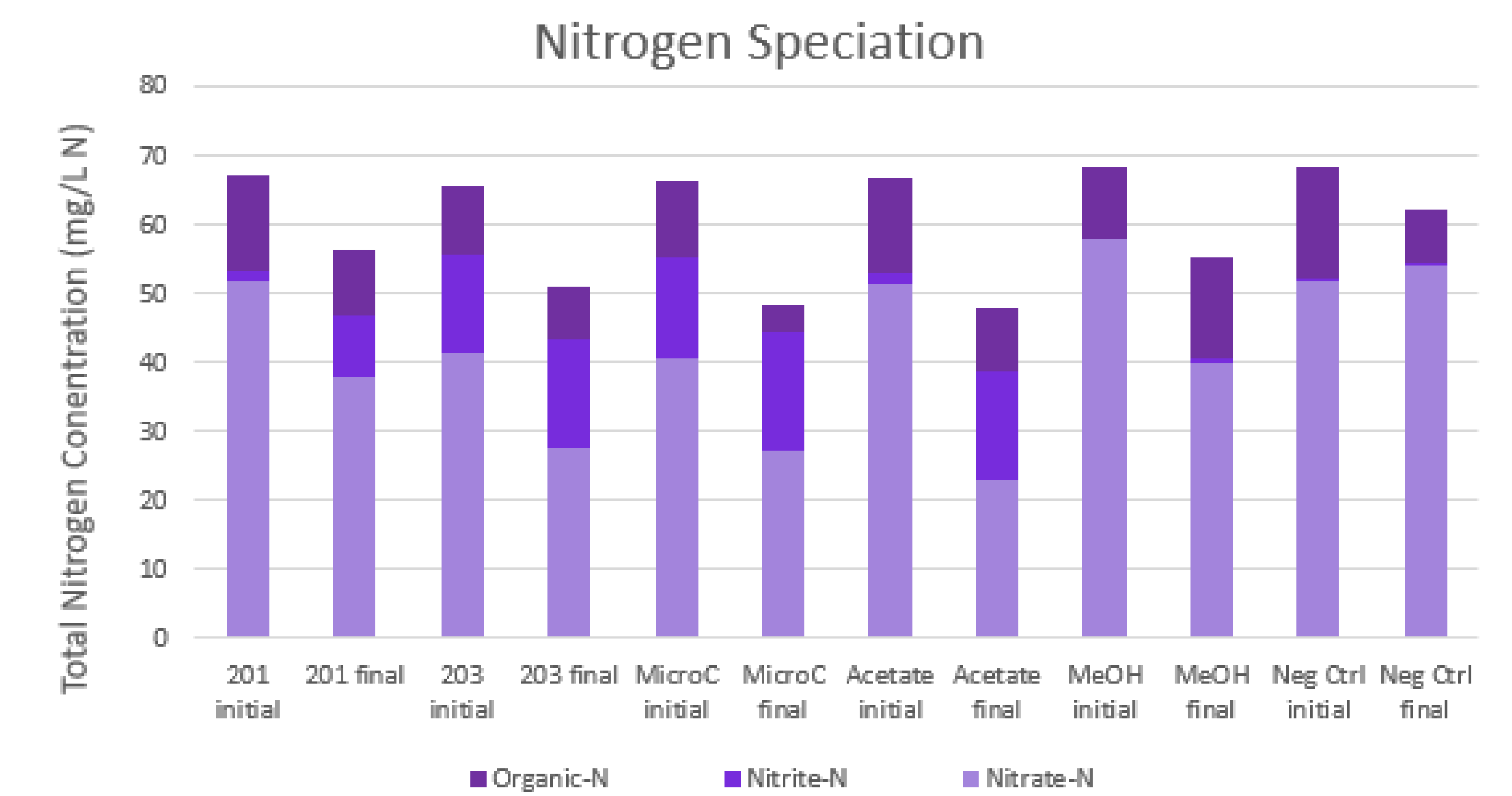


Figure 7. Nitrogen Speciation for 1/19/19

Reasons for errors could include: differences in inoculum, inaccuracies in carbon source measurements due to viscosity, and improper inoculum mixing.

Conclusion

- 201 has a greater hourly rate than 203
- 203 has a greater overall rate than 201
- The speciation graph shows that 203 converted more nitrate into nitrite

Acknowledgements

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Figure 1. Inoculum separated into seven samples.



Figure 2. Inoculum samples on stir plate.

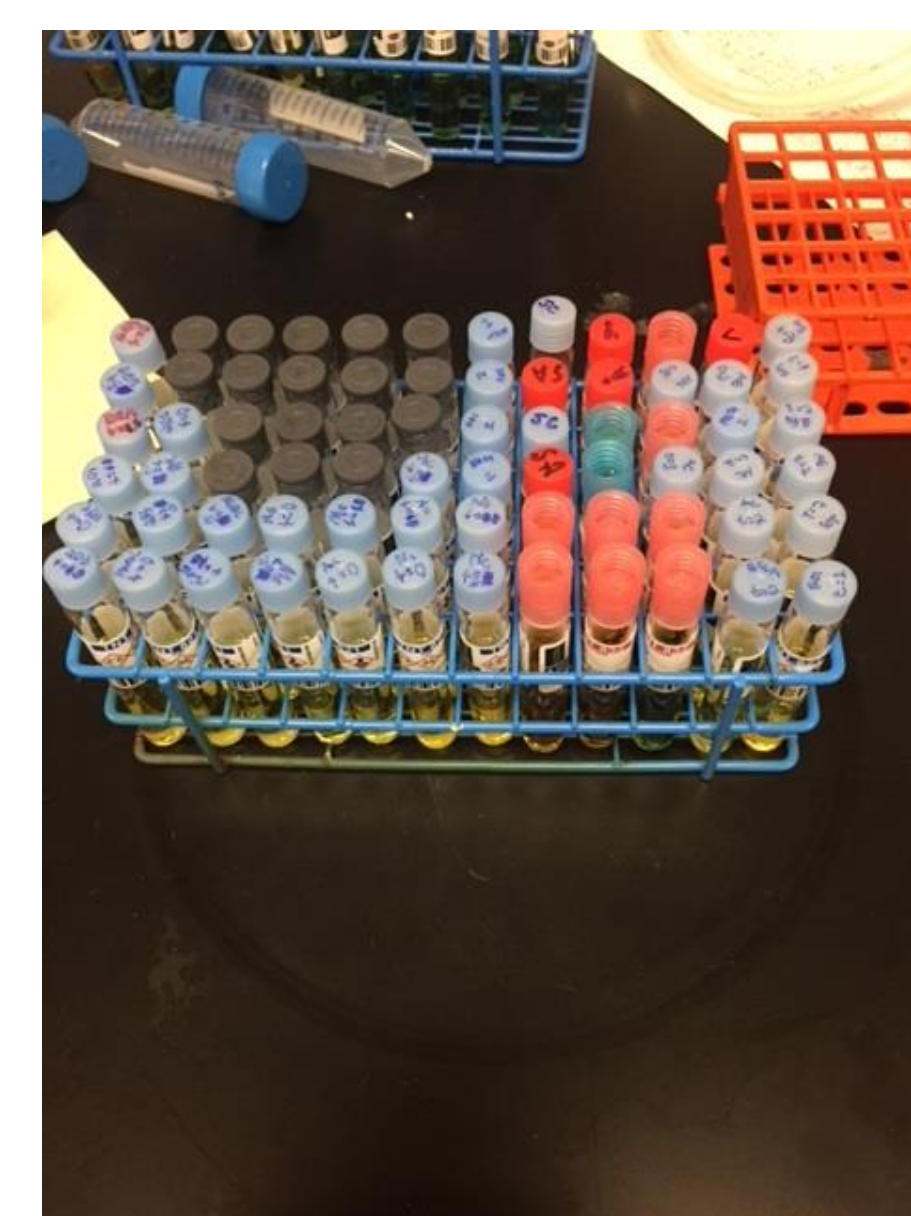


Figure 3. HACH kit COD vials prepared for reading.



Figure 4. HACH digital reactor block for COD digestion.



Figure 5. HACH spectrophotometer used for reading COD levels.