

Comparison of the Ammonia Trapping Performance of Different Gas-Permeable Tubular Membrane System Configurations

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SUPPLEMENTARY MATERIAL

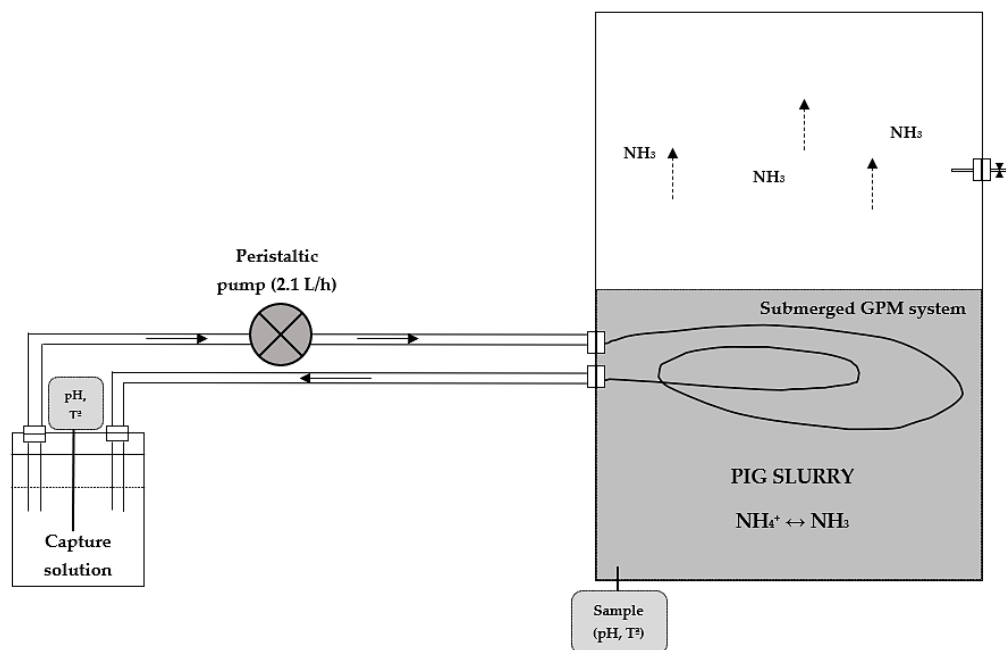


Figure S1. Scheme of the NH_3 capture process in the GPM S1 system, consisting of a submerged membrane without agitation or aeration of pig slurry.

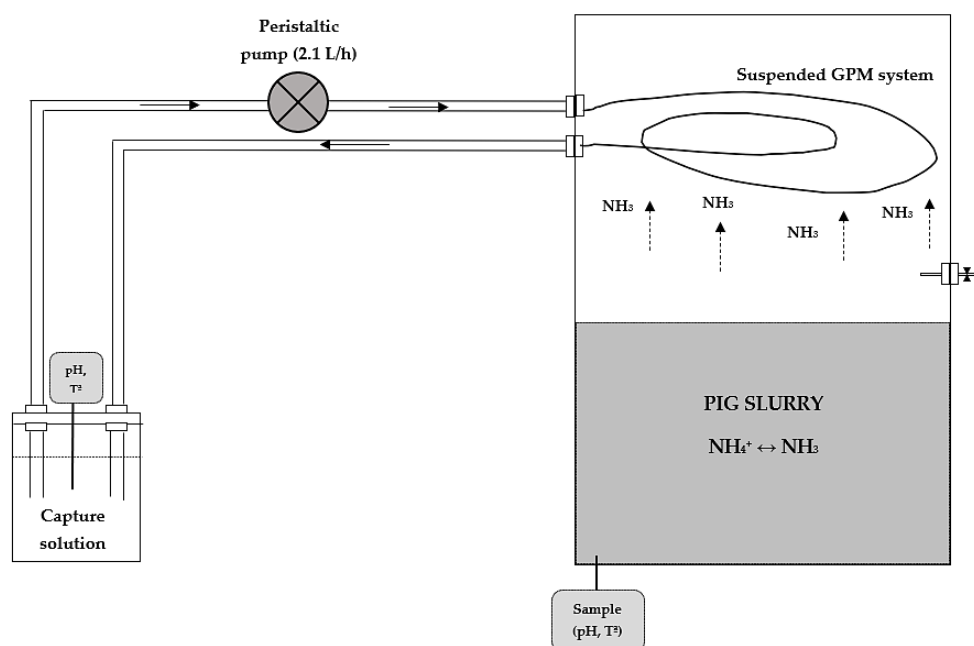


Figure S2. Scheme of the NH_3 capture process in the GPM S2 system, consisting of a suspended membrane without agitation or aeration of pig slurry.

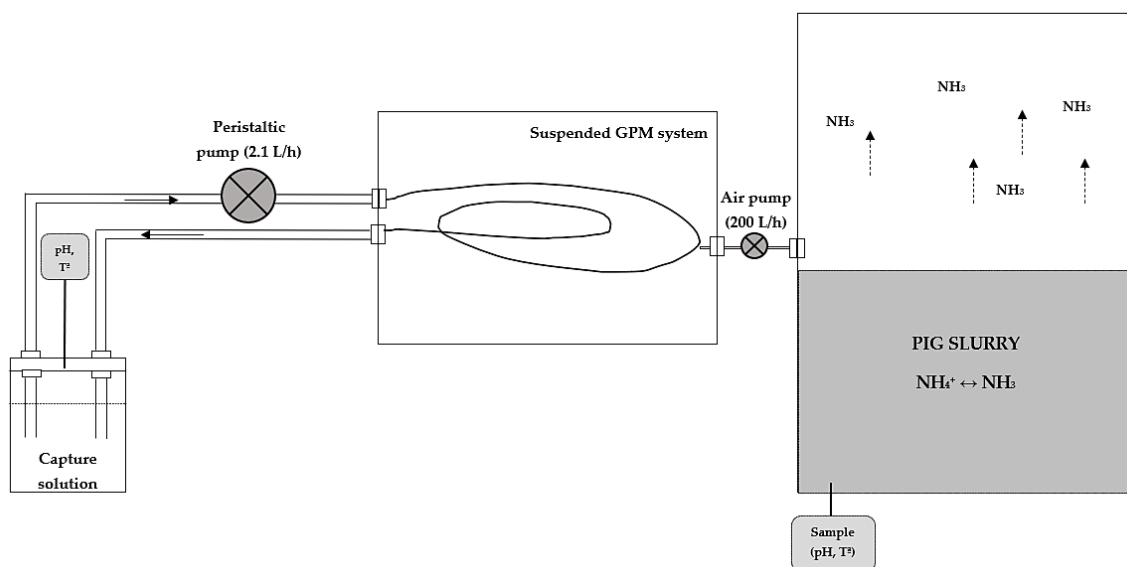


Figure S3. Scheme of the NH_3 capture process in the GPM S3 system, consisting of a membrane suspended in a compartment attached to the slurry treatment chamber, from which the NH_3 -laden air is sucked in.

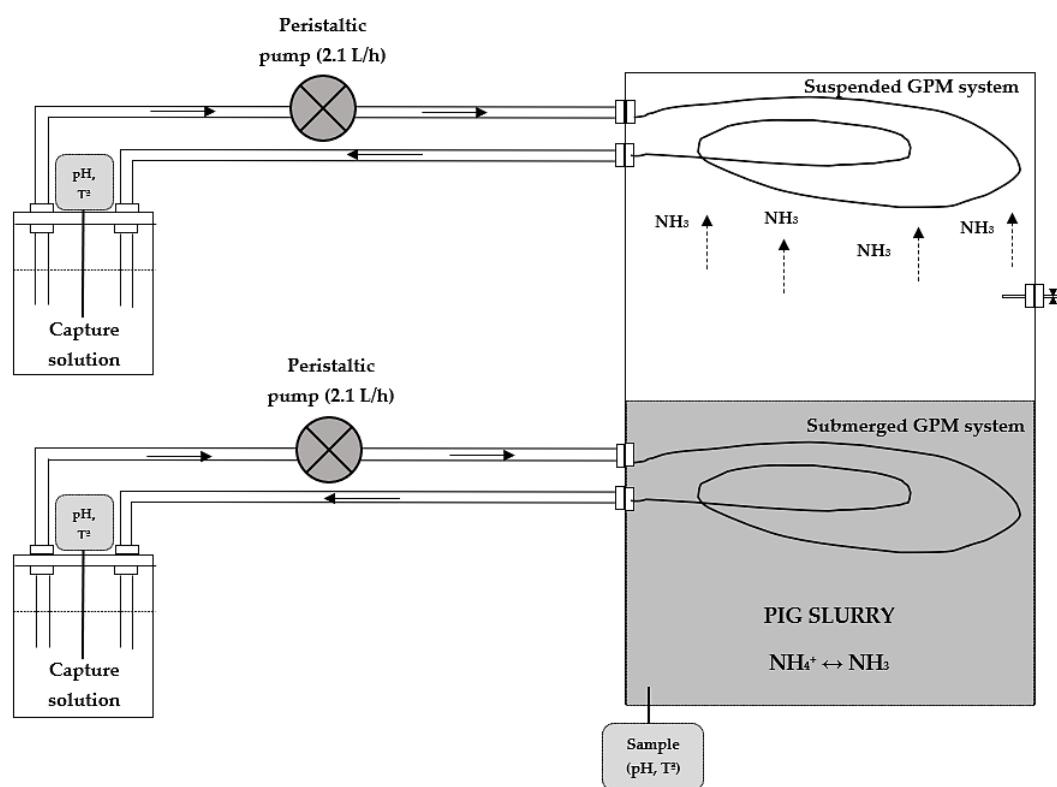


Figure S4. Scheme of the NH_3 capture process in the GPM S4 system consisting of a submerged and a suspended membrane without agitation and aeration of pig slurry.

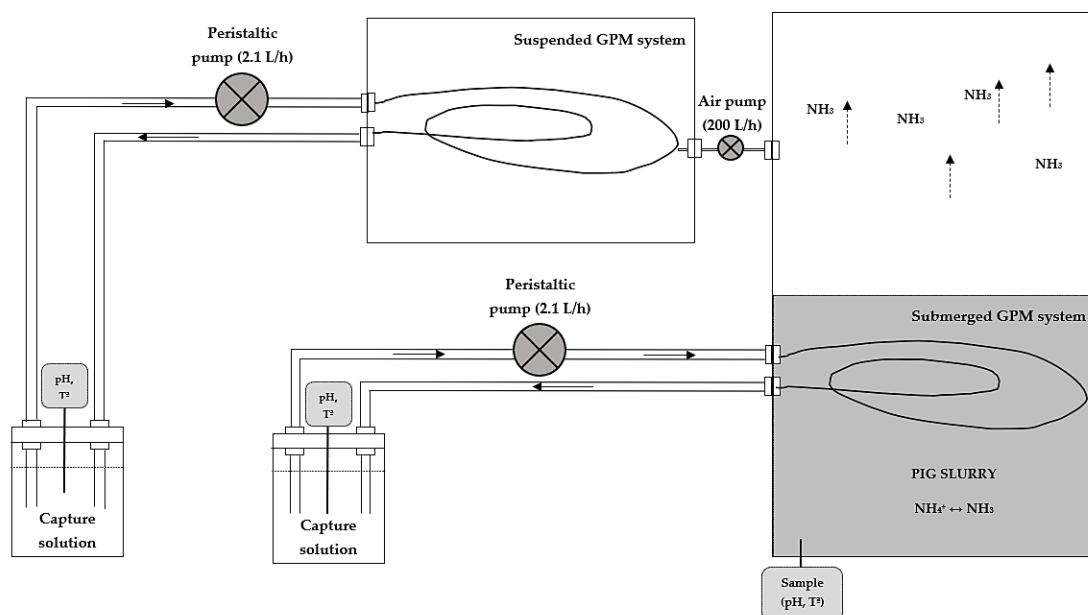


Figure S5. Scheme of the NH_3 capture process in the GPM S5 system, consisting of a suspended membrane in a compartment attached to the slurry treatment chamber, from which the NH_3 -laden air is sucked in, and a submerged membrane without agitation and aeration of pig slurry.

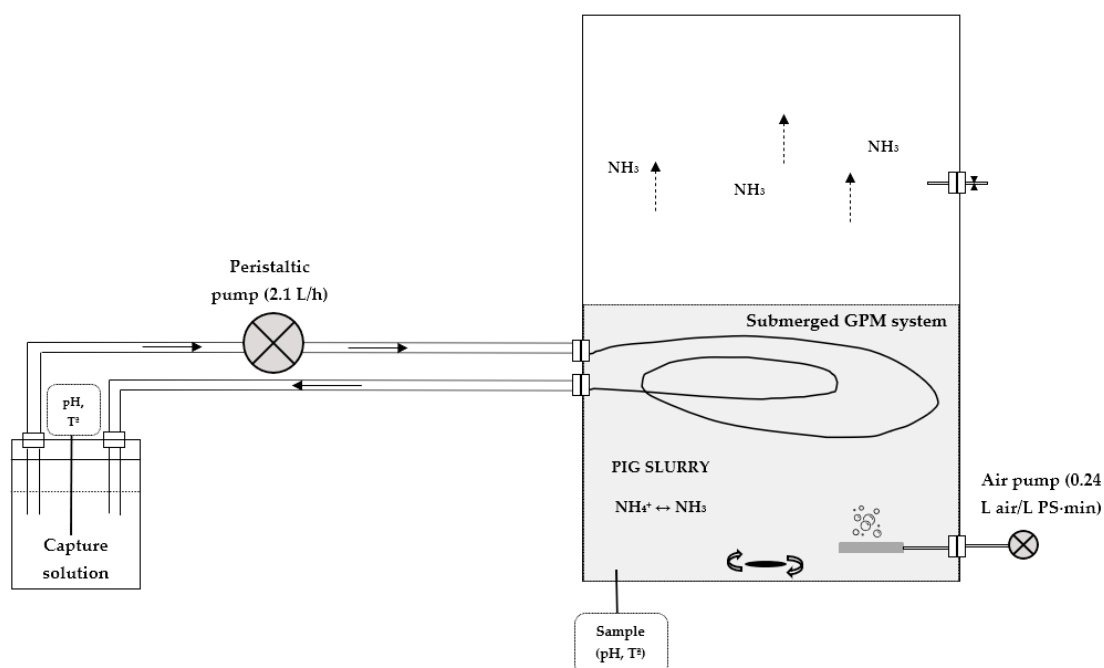


Figure S6. Scheme of the NH_3 capture process in the GPM S6 system, consisting of a submerged membrane with agitation and aeration of pig slurry.

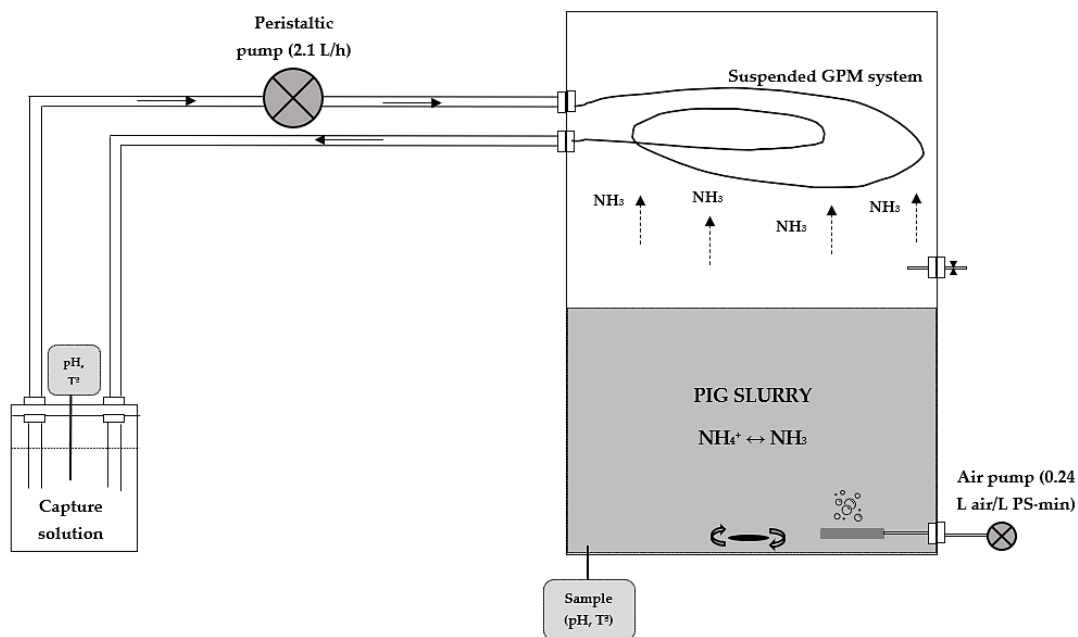


Figure S7. Scheme of the NH_3 capture process in the GPM S7 system, consisting of a suspended membrane with agitation and aeration of pig slurry.

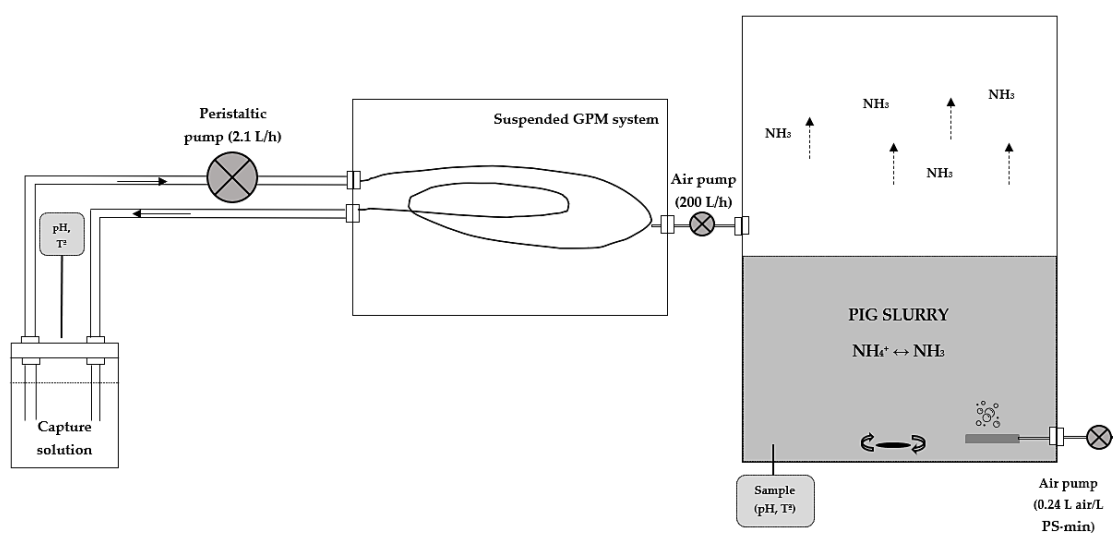


Figure S8. Scheme of the NH_3 capture process in the GPM S8 system, consisting of a membrane suspended in a compartment attached to the slurry treatment chamber with agitation and aeration of pig slurry, from which NH_3 -laden air is sucked in.

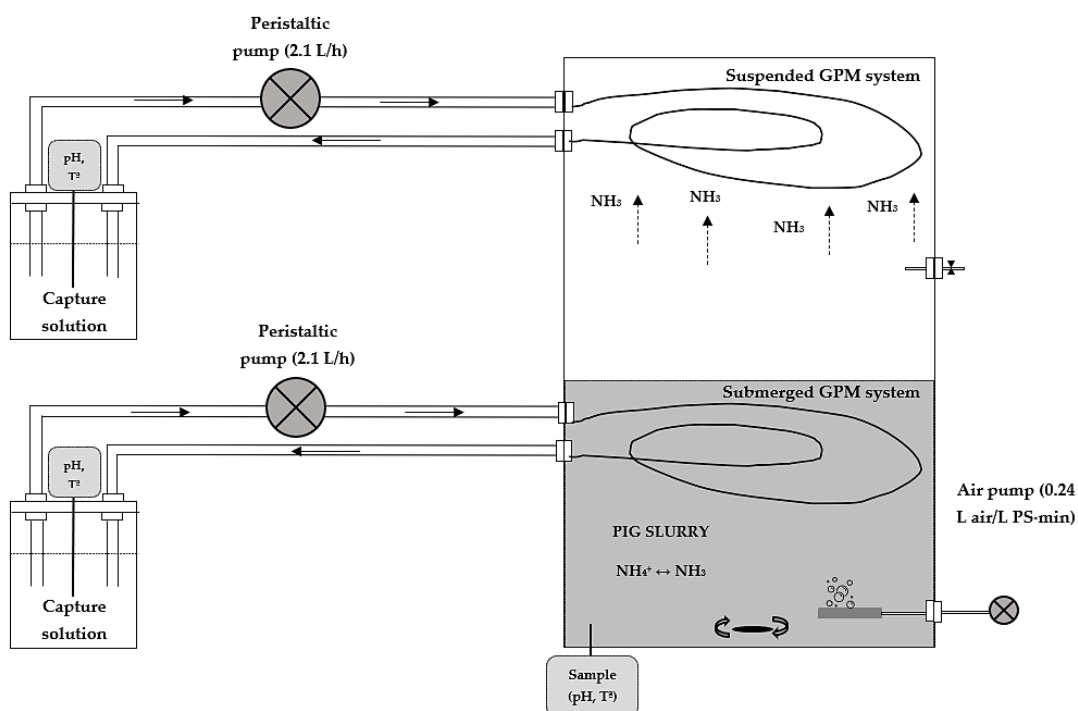


Figure S9. Scheme of the NH_3 capture process in the GPM S9 system, consisting of a submerged and a suspended membrane with agitation and aeration of pig slurry.

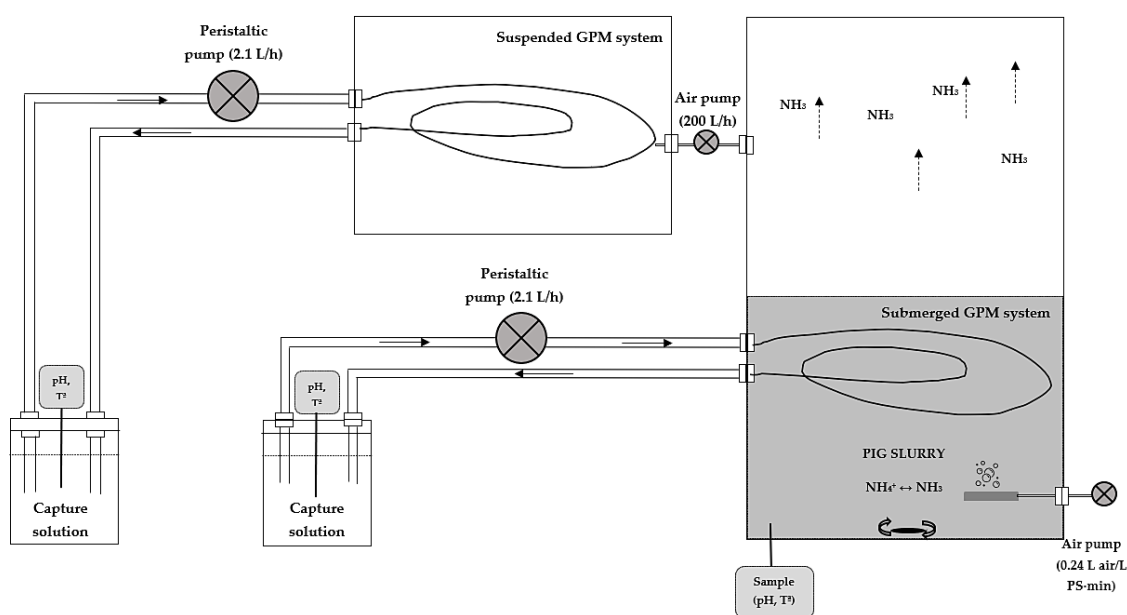


Figure S10. Scheme of the NH_3 capture process in the GPM S10 system, consisting of a suspended membrane in a compartment attached to the slurry treatment chamber, from which the NH_3 -laden air is sucked in, and a submerged membrane with agitation and aeration of pig slurry.

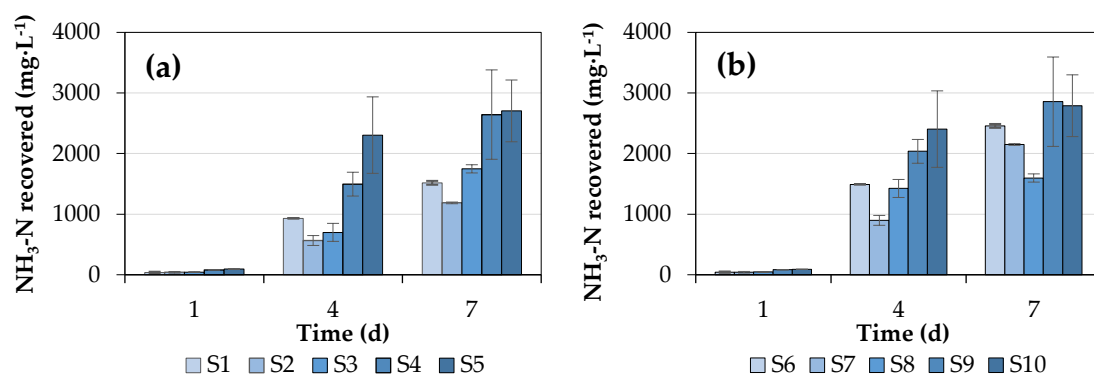


Figure S11. Evolution of $\text{NH}_3\text{-N}$ concentration in the acid capture solution in (a) systems S1-S5 without slurry aeration and agitation; and (b) systems S6-S10 with slurry agitation and aeration. The meaning of the abbreviations is presented in section 2.2.