

NATIONAL TECHNICAL UNIVERSITY OF ATHENS
SCHOOL OF CHEMICAL ENGINEER
Unit of Environmental Science and Technology

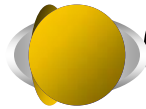


Presentation

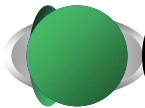
**Research on the improvement of food waste home composting
using different additives**

M. Margaritis, K. Psarras, D. Malamis, K.J. Haralambous

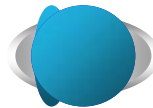
Points of Interest



What is composting



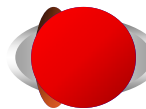
Presentation of Prototype System



Composting Process

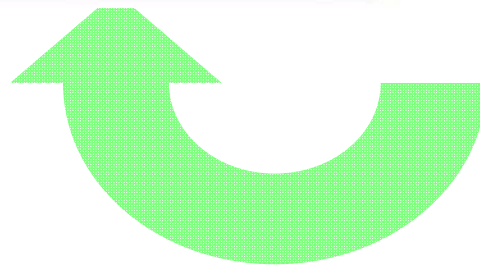
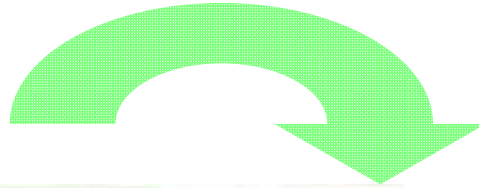


Evaluation of Final Product



Conclusions

Home Composting



Prototype Composting System



Agitation system

Feeding compartment

**Composting process
compartment**

**Compost collection and
removal compartment**

**Leachates collection and
removal compartment**

Experimental Procedure (I)

- Four (4) household composting systems were installed at the premises of the National Technical University of Athens
- kitchen waste as feedstock, in combination with additives such as sawdust (S), natural zeolite (Z), vermiculite (V) and perlite (P) on a continuous mode
- Retention time of the substrate into the system was 21days.
- Analyses were performed for the characterisation of the feed material & for the evaluation of the end product
- T, O₂ and H₂O content were monitored throughout the duration of the composting cycles

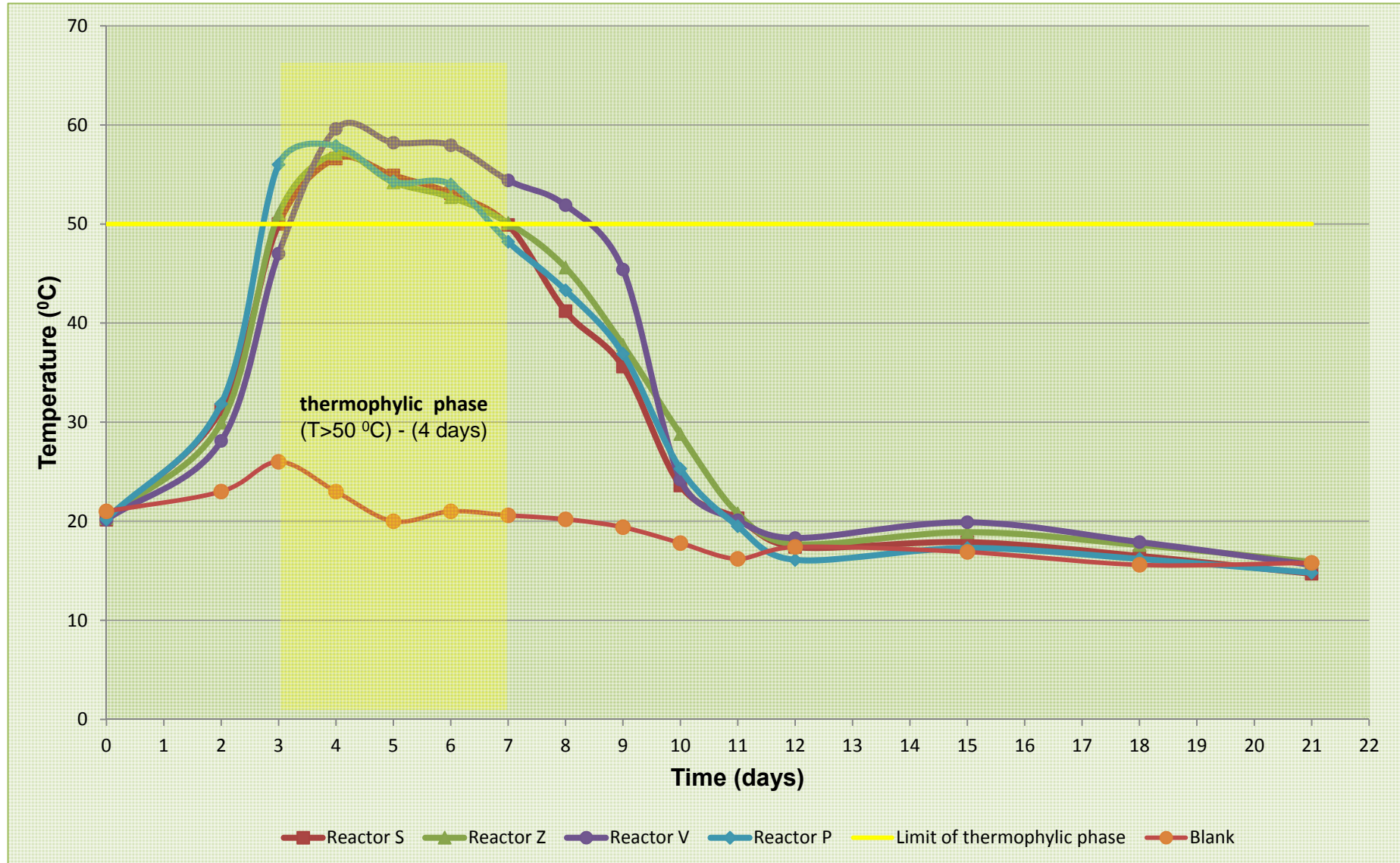
Experimental Procedure (II)

Trial	Sawdust (S) (% w.w.)	Zeolite (Z) (% w.w.)	Vermiculite (V) (% w.w.)	Perlite (P) (% w.w.)
Blank	0	0	0	0
Reactor S	10	0	0	0
Reactor Z	10	10	0	0
Reactor V	10	0	10	0
Reactor P	0	0	0	10

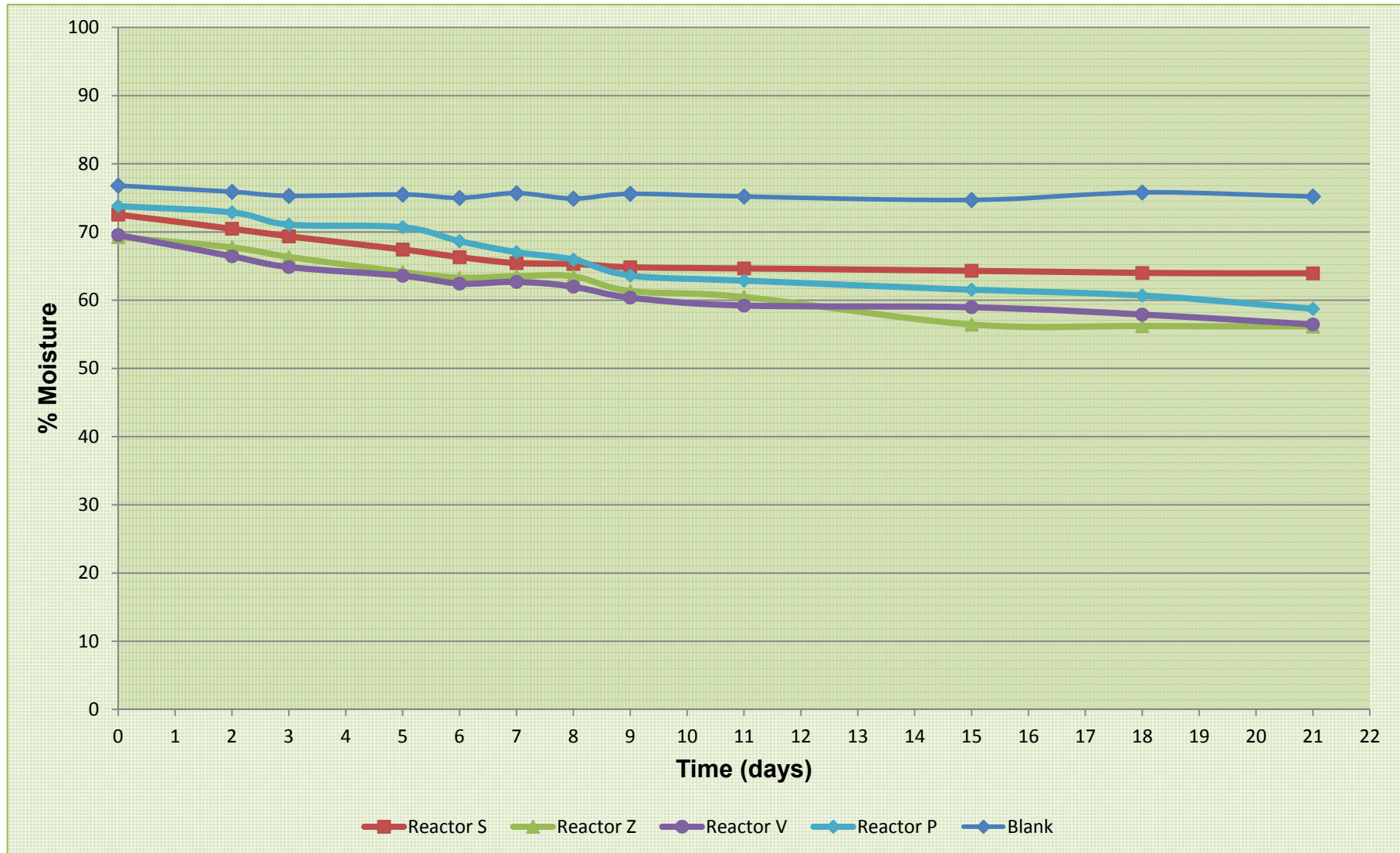
Studied Parameters

- Temperature
- pH
- Moisture
- TOC
- TKN
- C/N
- NH₄⁺
- NO₃⁻
- Metals
- Phytotoxicity

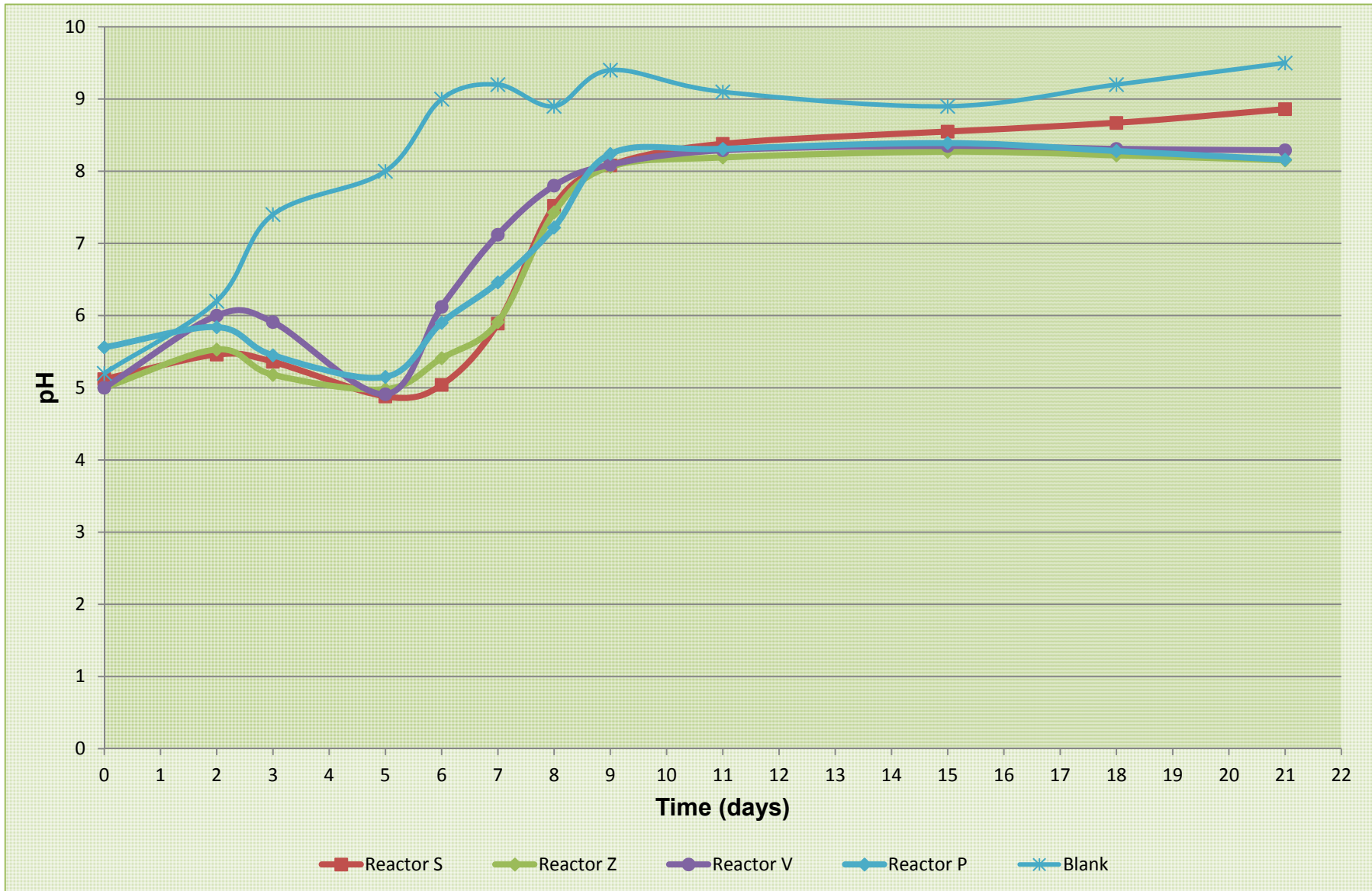
Temperatute



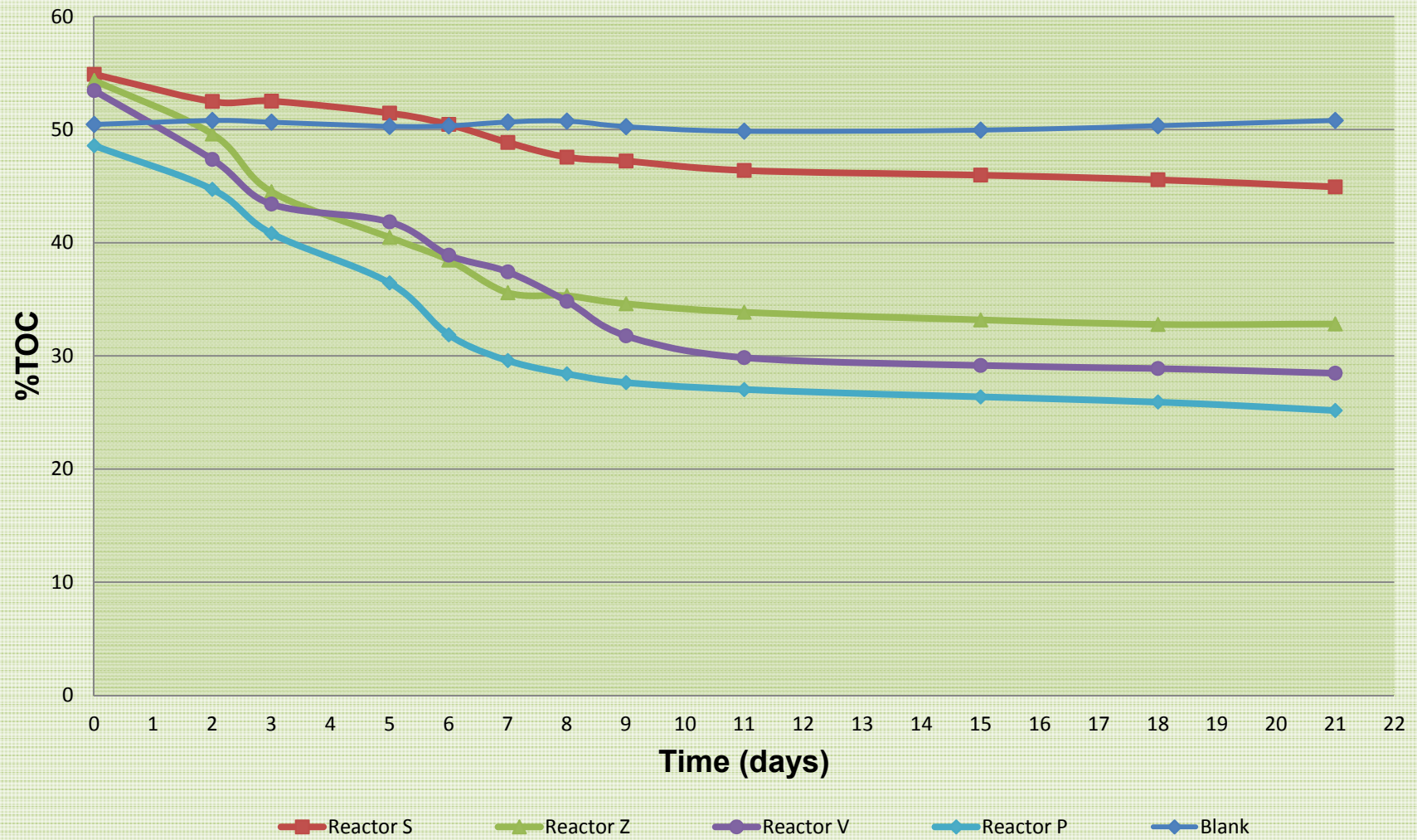
Moisture



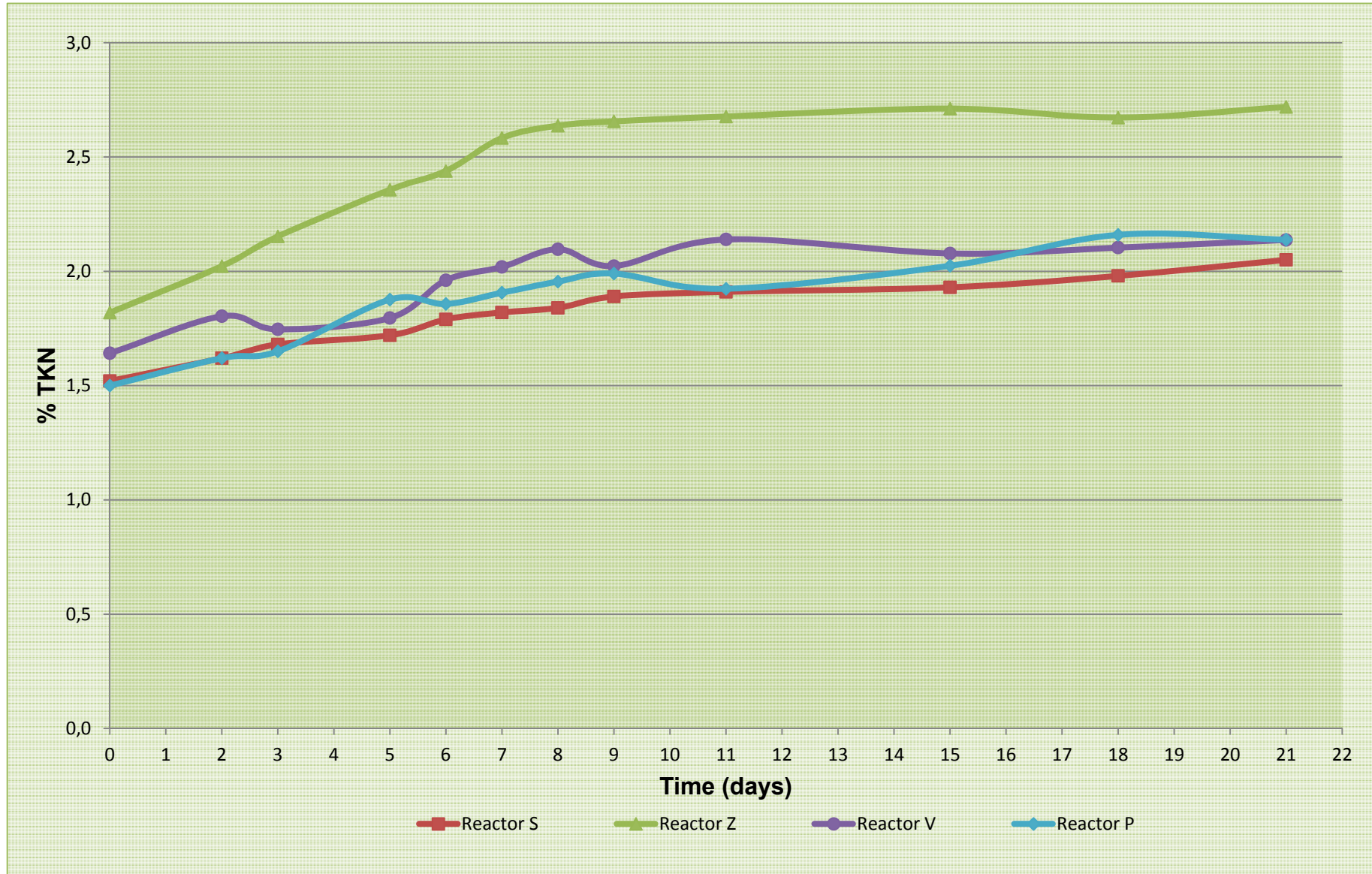
pH



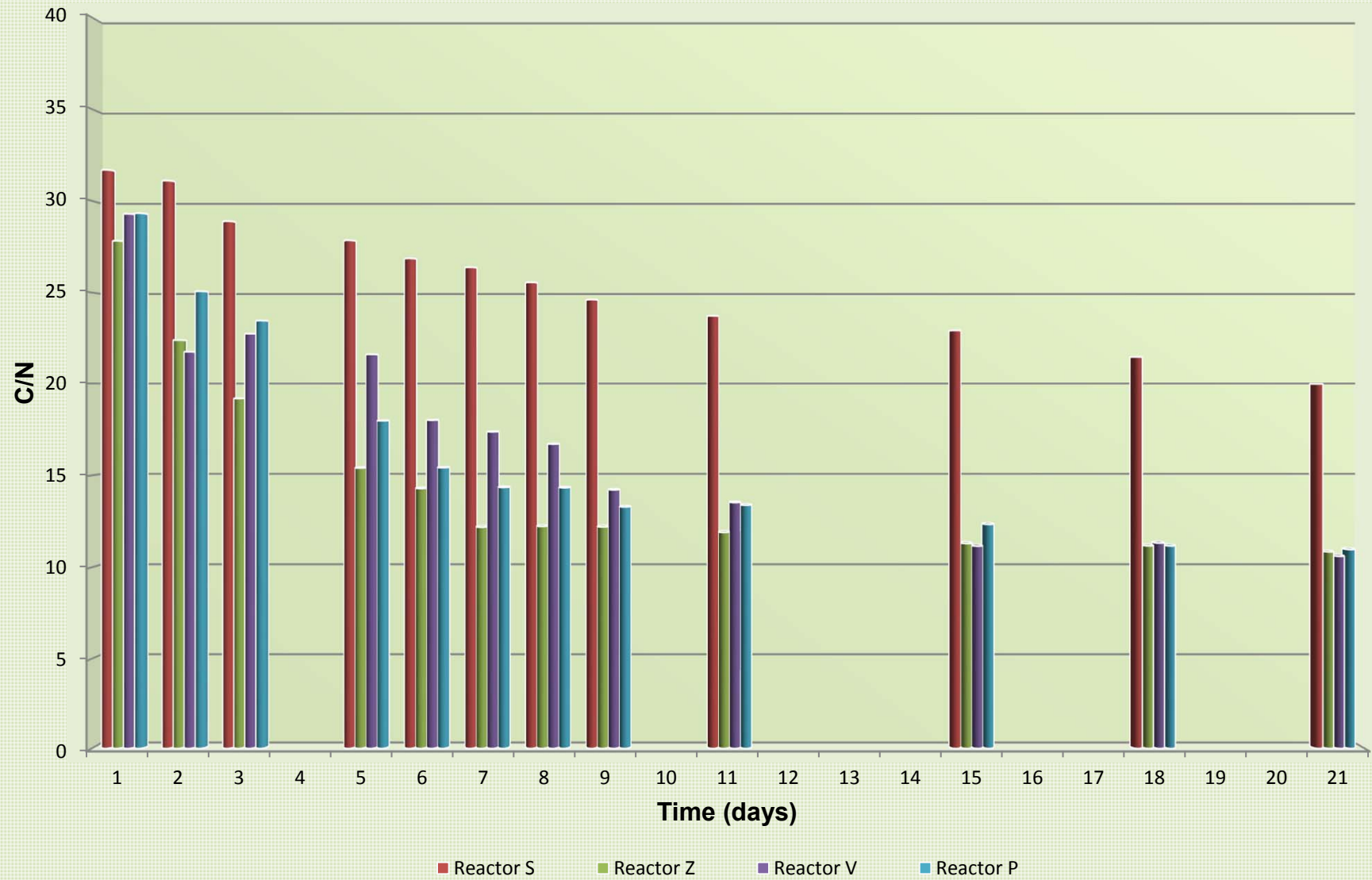
TOC



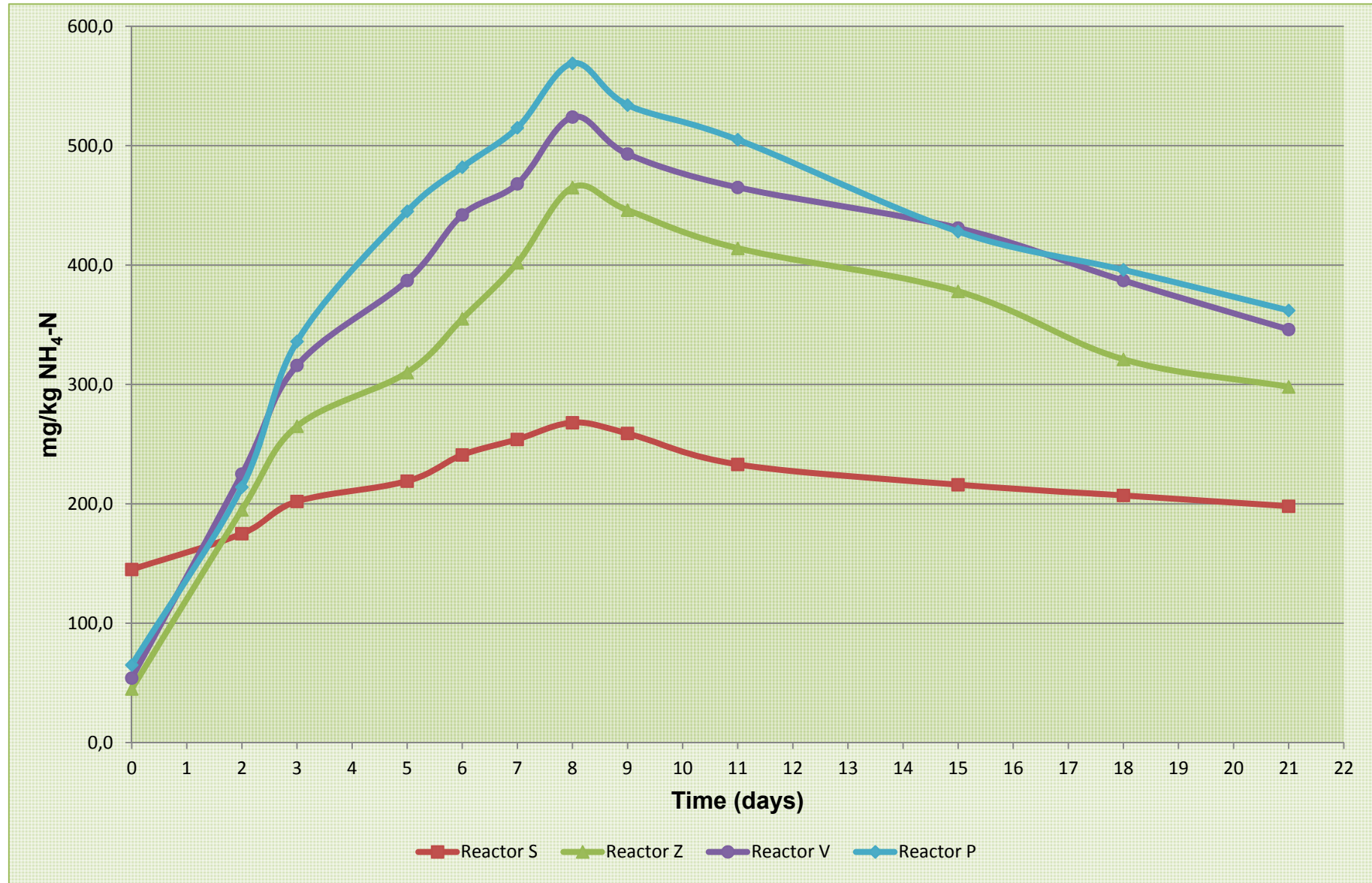
TKN



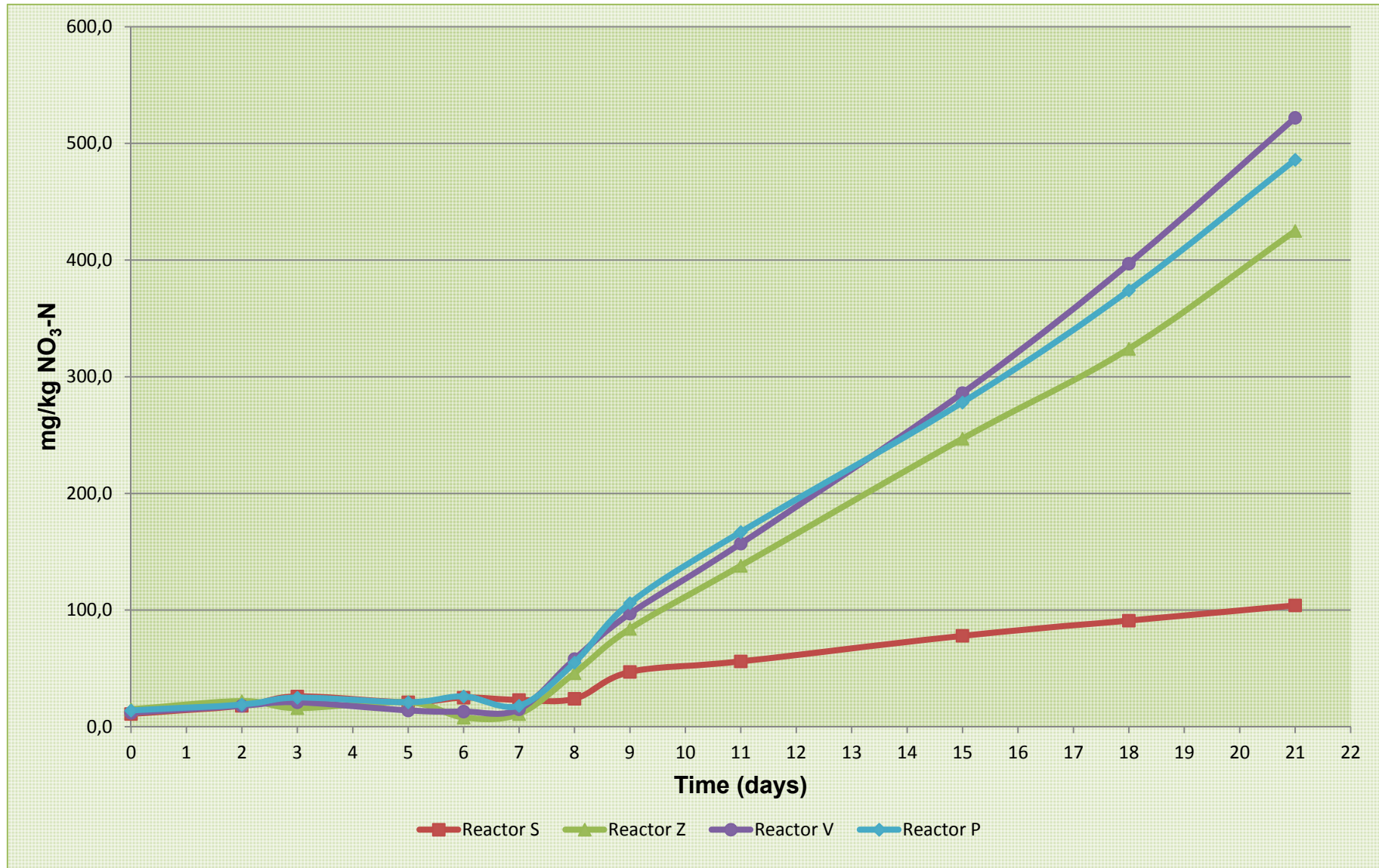
C/N



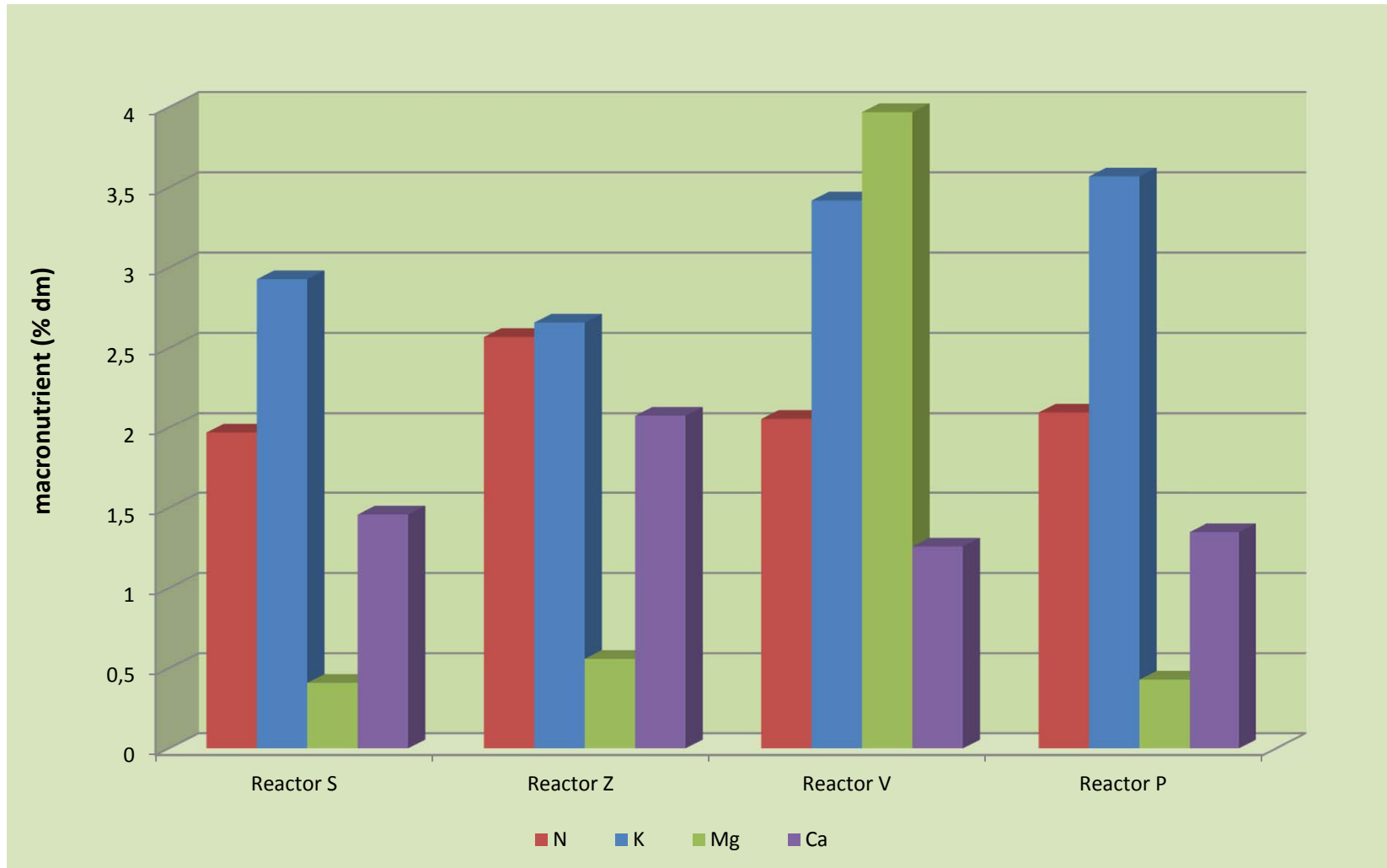
NH₄⁺



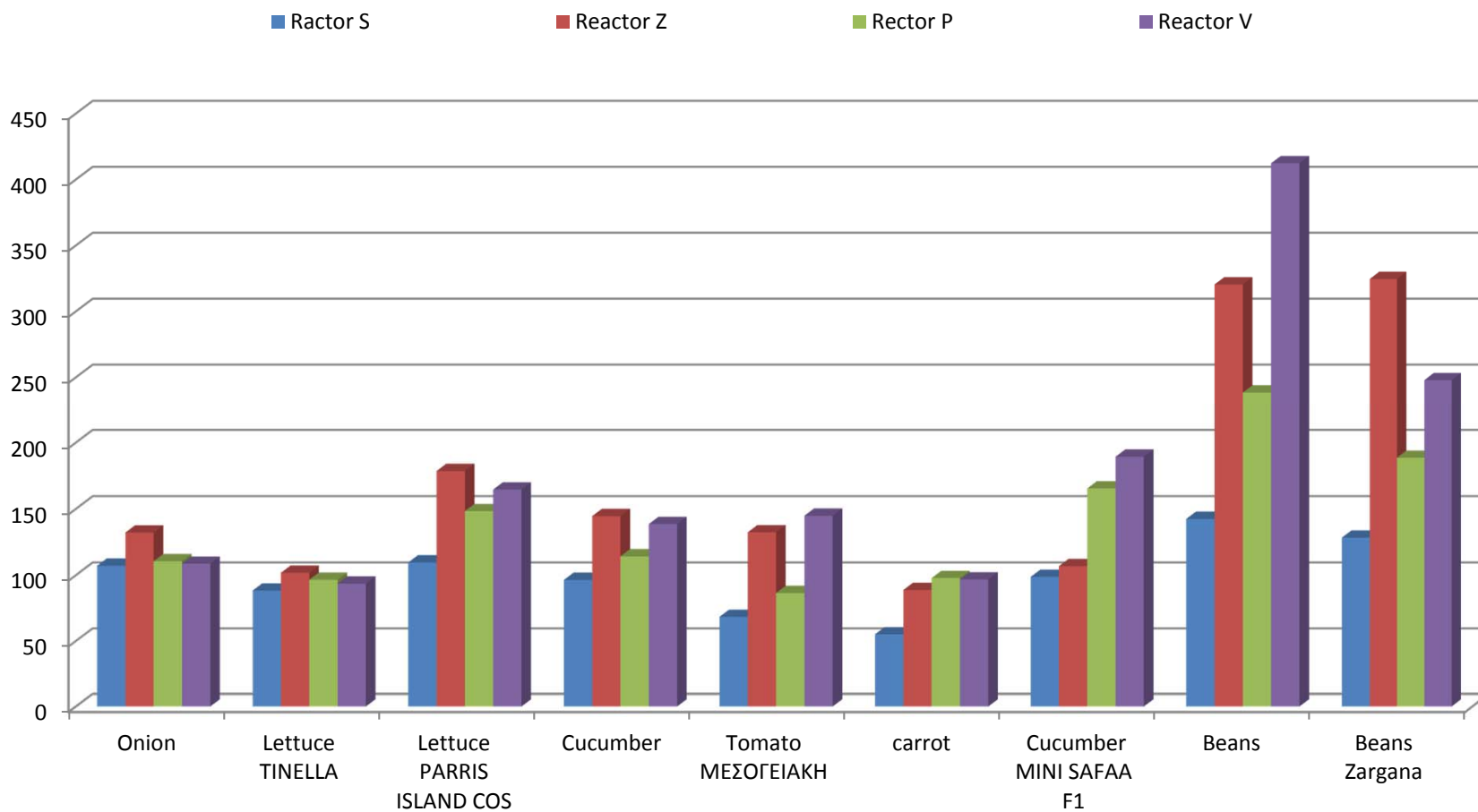
NO₃⁻



Final Product - Metals



Final Product - Phytotoxicity



Conclusions

- The developed prototype household system has a good performance with respect to the composting process and the operational characteristics
- The end product presented good quality characteristics
- The presence of additives yields better quality compost
- An ordinary household can manage its kitchen waste at source and can potentially produce high quality compost using an appropriate household composting system
- The addition of zeolite can substantially enhance the agronomic value of the produced compost while at the same time reducing the level of odour.
- Home composting has the potential to significantly contribute towards:
 - diversion of the organic fraction of MSW from landfills
 - recycling essential nutrients and organic matter back to soil

Thank you
for your attention!