



## **Simulation and factorial design of modified Ludzack Ettinger plant**

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In this research an analysis about a modified Ludzack Ettinger plant is developed for domewastes. The plant is modelled and simulated in Super Pro Design and it is composed by grid, anoxic reactor, aerobic reactor, settler and filter press.

A factorial design, according Yate's algorithm, at 2 levels is developed considering 4 factors as: the resident time of anoxic reactor (factor A), the resident time of aerobic reactor (factor B), internal recycle ratio (factor C), external recycle ratio (factor D). The concentration of  $\text{NH}_3$ , TKN,  $\text{NO}_3$ , total nitrogen, COD,  $\text{BOD}_5$ , in addition to the SRT of anoxic and aerobic reactors are the analyzed responses.

Results show that for the concentration of  $\text{NH}_3$  factors B, C, D and interactions AB, BC, BD, ABD, CD are significant. For the concentration of TKN factors B, C, A and interactions BD, BC, BCD are significant. For the concentration of  $\text{NO}_3$  factors B, C, D are significant. For the concentration of total nitrogen factors B, C, D, A are significant. For the concentration of COD factors B, C, D and interactions BC, BD, BCD are significant while for the concentration of  $\text{BOD}_5$  all main factors and interactions AB, AC, BC, ABC, BD, CD, BCD are significant. For the SRT of anoxic reactor all main factors and interactions AB, AC, BC, ABC, AD, BD, CD, ACD are significant. For the SRT of anaerobic reactor factor B, C, D and interactions BC, BD, CD, BCD are significant.

### **Biography**

Grazia Leonzio is a PhD student from L'Aquila University. She published several articles and participated to several international and national congresses about environmental and energy aspect of chemical processes. She wrote an article about waste management in Italian regions and published in Columbia University web-side. She participated to M.U.N conferences and she is a member of several associations: A.I.D.I.C. (Italian Association Of Chemical Engineering), S.C.I. (Italian Chemical Society), I.S.S.N.A.F. (Italian Scientists and Scholars in North America), E.C.A.S. (European Commission Authentication Service). She is a referee of several journals.

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Category: E-poster presentation