

MODELING BIODEGRADATION PROCESSES IN COMPOSTING PLANTS: DYNAMICS AND CONTROL

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In this talk, we focus on aerobic composting processes that arise in composting plants. In such plants, decomposition processes may be activated by a suitable amount of biomass in a bioreactor and is encouraged by recirculation of leachate and oxygen intake through mechanical aeration. The main mechanisms involved in the process are: (a) *aerobic biodegradation*, where the soluble substrate is digested by aerobic bacteria using oxygen, the concentration of biomass increases and inert matter (pre-compost) is produced; (b) *hydrolysis*, which transforms the insoluble substrate in the soluble one; (c) *biomass decay*, where the death of bacteria generates a part of insoluble substrate and a part of inert material.

The proposed mathematical approach is within the framework of batch culture and population–pollutants interaction modeling [1, 2, 3, 4, 5]. The dynamics and control of the biodegradation processes will be discussed and some applications to real cases will be presented.

References

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