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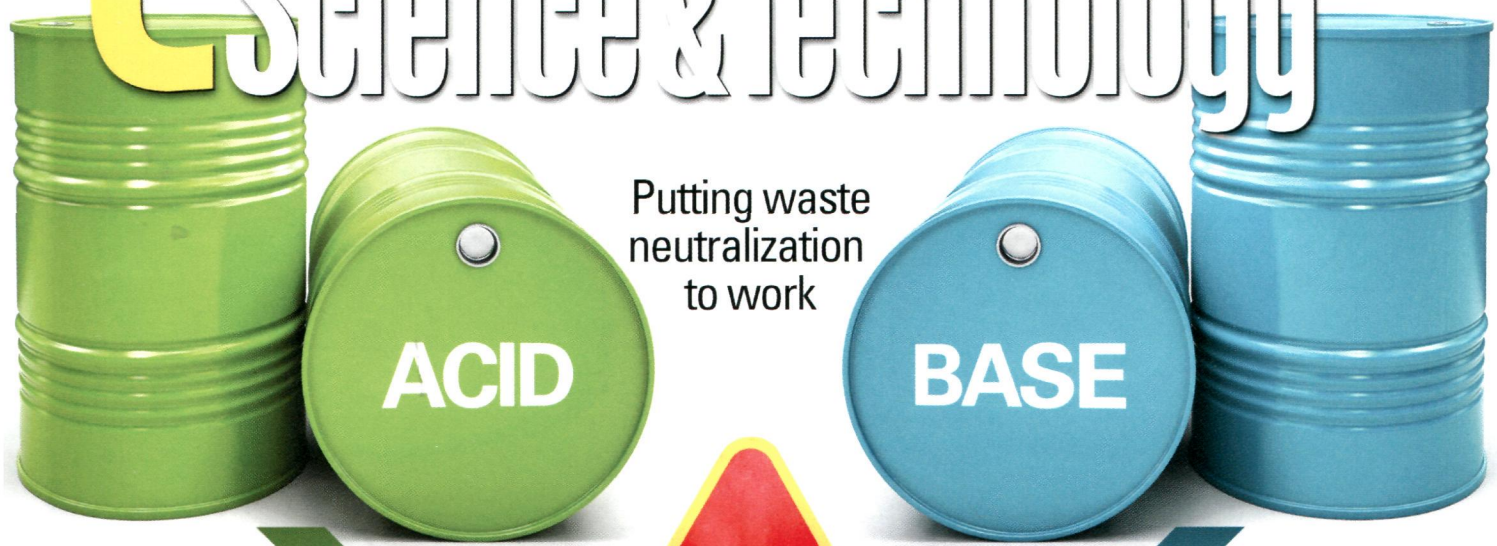
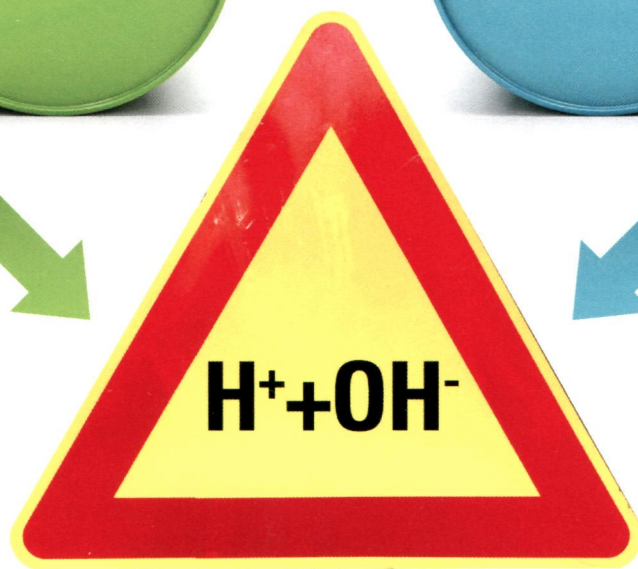


Putting waste neutralization to work



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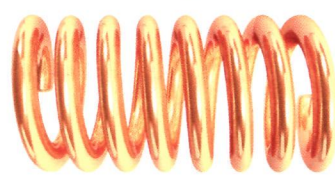

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ENVIRONMENTAL Science & Technology

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ON THE COVER: Waste acid neutralization is a pollution control process practiced globally. In principle, acid-base neutralization involves association of H^+ and OH^- to form water molecules and is thermodynamically favorable and kinetically fast. The energy embedded in the process, however, remains untapped. Opportunities are presented to drive processes aided by acid-base neutralization.

Features

Acid–base neutralization reaction in the aqueous phase is thermodynamically favorable and kinetically fast. Waste acid neutralization is also the most common waste management practice globally. However, waste acid neutralization is yet to be used for any work/energy generation because of the low concentrations of the waste acid and the high heat capacity of aqueous solutions. In this paper, we address potential processes that can effectively take advantage of the high energy inherent in neutralization reactions, in accordance with the goal of sustainable development.Acid–base neutralization reaction in the aqueous phase is thermodynamically favorable and kinetically fast. Waste acid neutralization is also the most common waste management practice globally. However, waste acid neutralization is yet to be used for any work/energy generation because of the low concentrations of the waste acid and the high heat capacity of aqueous solutions. In this paper, we address potential processes that can effectively take advantage of the high energy inherent in neutralization reactions, in accordance with the goal of sustainable development.

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Comment

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Energy and the Environment

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(S) Supporting Information available via online article