

Think It Over



This section of *Resonance* presents thought-provoking questions, and discusses answers a few months later. Readers are invited to send new questions, solutions to old ones and comments, to 'Think It Over', *Resonance*, Indian Academy of Sciences, Bangalore 560 080. Items illustrating ideas and concepts will generally be chosen.

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How much can pH Change through Dilution?

Let us consider an acidic solution with a hydrogen ion concentration, $[H^+]$ of $10^{-5}M$. Since $pH = -\log [H^+]$ the pH of the solution is 5. Suppose we dilute the solution 10 times with water. Now, $[H^+]$ is $10^{-6} M$ and the pH is 6. Further dilution should increase the pH from 6 to 7 and then from 7 to 8 and ... Can this go on for ever? Does this not imply that an acidic solution can be made basic/alkaline simply by adding water? Where is the catch?

Answer to 'Burning Question' which appeared in *Resonance*, Vol.3, No.3, March 1998 by Vilas Gohad.

❶ To determine 45 minutes

Burn both ends of one lace and one end of the other lace at the same time.

First lace being ignited from both the ends will burn for 30 minutes and will be fully burnt.

The other lace will also burn for 30 minutes in the same period and 30 minute length will remain.

Now, ignite the other end also of the second lace. Its remaining length will burn for 30 minutes. Therefore, it will burn for 15 minutes, being now ignited at both ends.

The time from first lace is 30 minutes and from the second lace is 15 minutes, hence we get a total of 45 minutes.