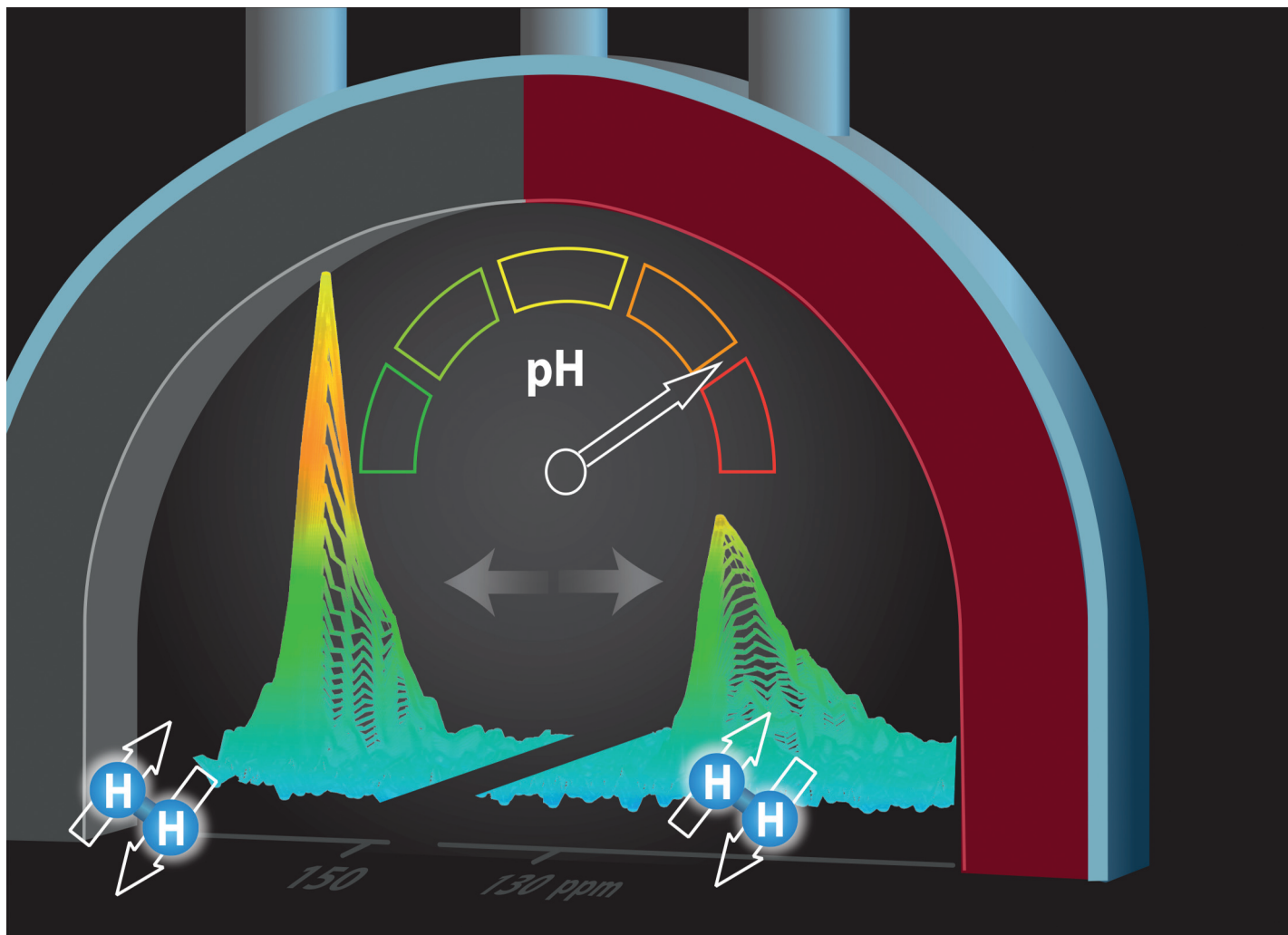


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Showcasing research from Dr. Stefan Glöggler's team, NMR Signal Enhancement Group, Max Planck for Multidisciplinary Sciences, Göttingen, Germany.

Parahydrogen-enhanced pH measurements using $[1-^{13}\text{C}]$ bicarbonate derived from non-enzymatic decarboxylation of $[1-^{13}\text{C}]$ pyruvate- d_3

Non-invasive magnetic resonance methods to measure pH offer a new approach for early diagnosis of diseases characterized by acid-base imbalances. We present an optimized preparation of an hyperpolarized $\text{H}^{13}\text{CO}_3^-/^{13}\text{CO}_2$ pH sensor via non-enzymatic decarboxylation with H_2O_2 of $[1-^{13}\text{C}]$ pyruvate- d_3 . Unprecedented degrees of ^{13}C signal-enhancements of purified $[1-^{13}\text{C}]$ pyruvate- d_3 were obtained using parahydrogen allowing for a secondary reaction to release the pH sensor. *In vitro* validations demonstrated accurate pH calculations. Our results highlight the efficiency of a pH sensor generated in less than one minute, with remarkable polarization, and biocompatibility suitable for future *in vivo* studies.

As featured in:



See Stefan Glöggler *et al.*, *Analyst*, 2024, **149**, 5022. Image designed and illustrated by Hartmut Sebesse, MPINAT MediaService