EFFECT OF GAS ATMOSPHERE DURING G-C_3N_4 SYNTHESIS ON PHOTOCATALYTIC H_2 PRODUCTION

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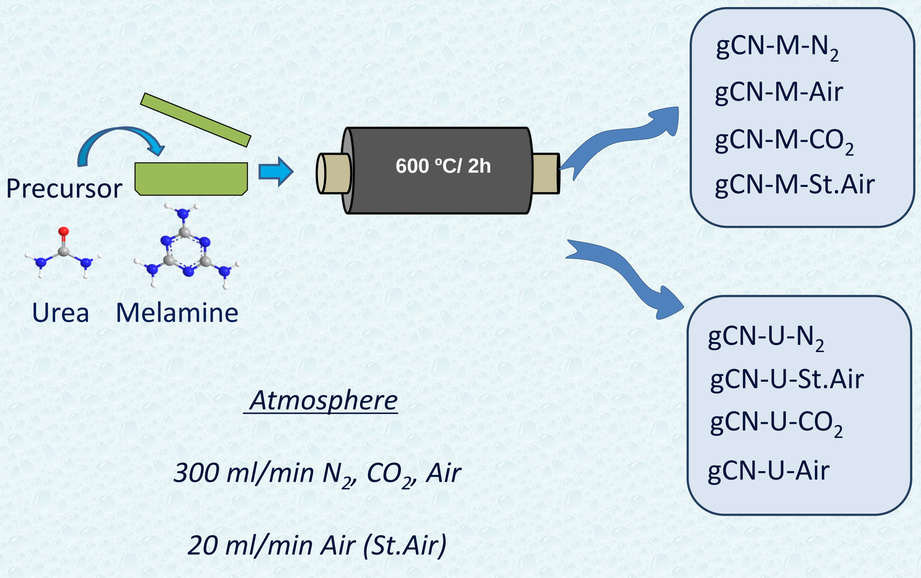
INTRODUCTION

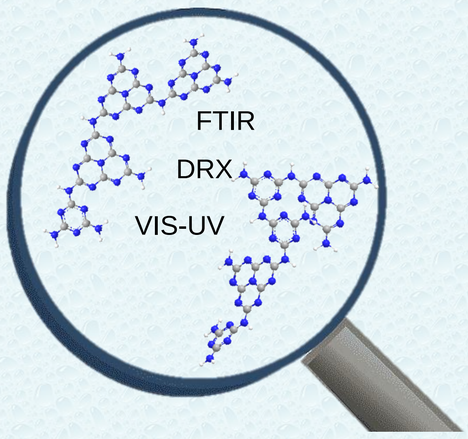
Replacement of fossil fuels with green H_2 appears to be an option to avoid the emission of greenhouse gasses. Solar H_2 generation through water splitting has great potential to overcome environmental issues associated with energy production. Graphitic carbon nitride (gCN) has been studied for this purpose because it is low-cost, easy to prepare, shows absorption in the visible regions and has a suitable band gap. Despite of this, gCN has problems associated to its limited light absorption, small specific surface area and fast recombination of electron-hole pairs.

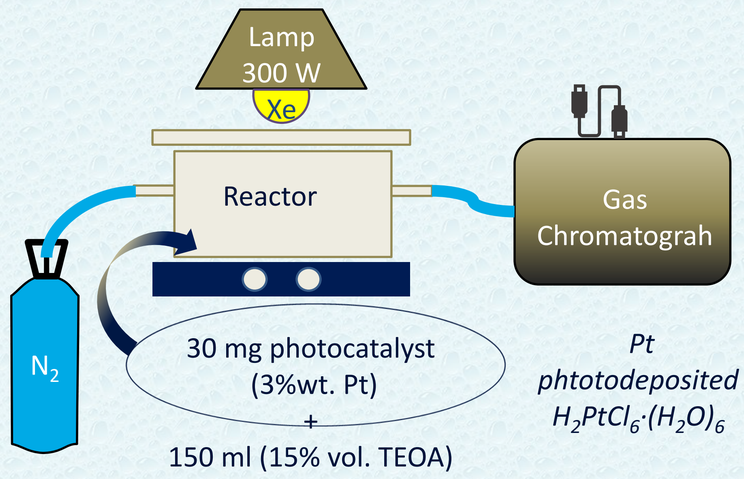
OBJECTIVE

The aim of this work was to establish a suitable combination of precursor and calcination atmosphere to produce gCNs with improved efficiency for H_2 via water splitting.

EXPERIMENTAL

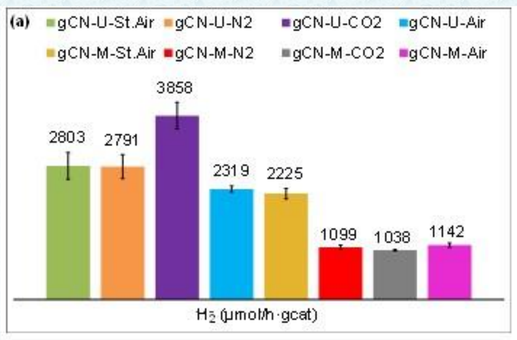


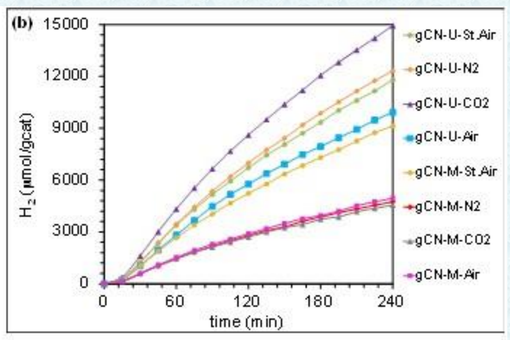


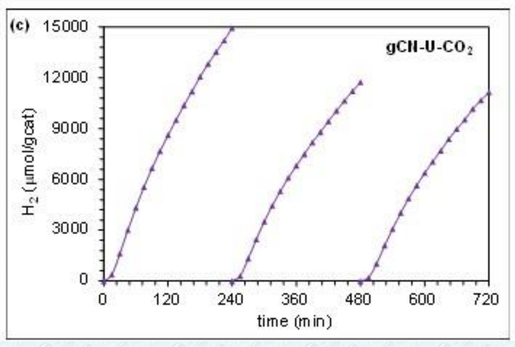


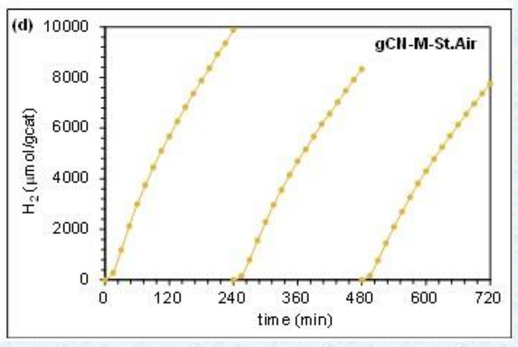
Elemental analysis g-$C_{2.8}N_{4.4}H_{2.0}$

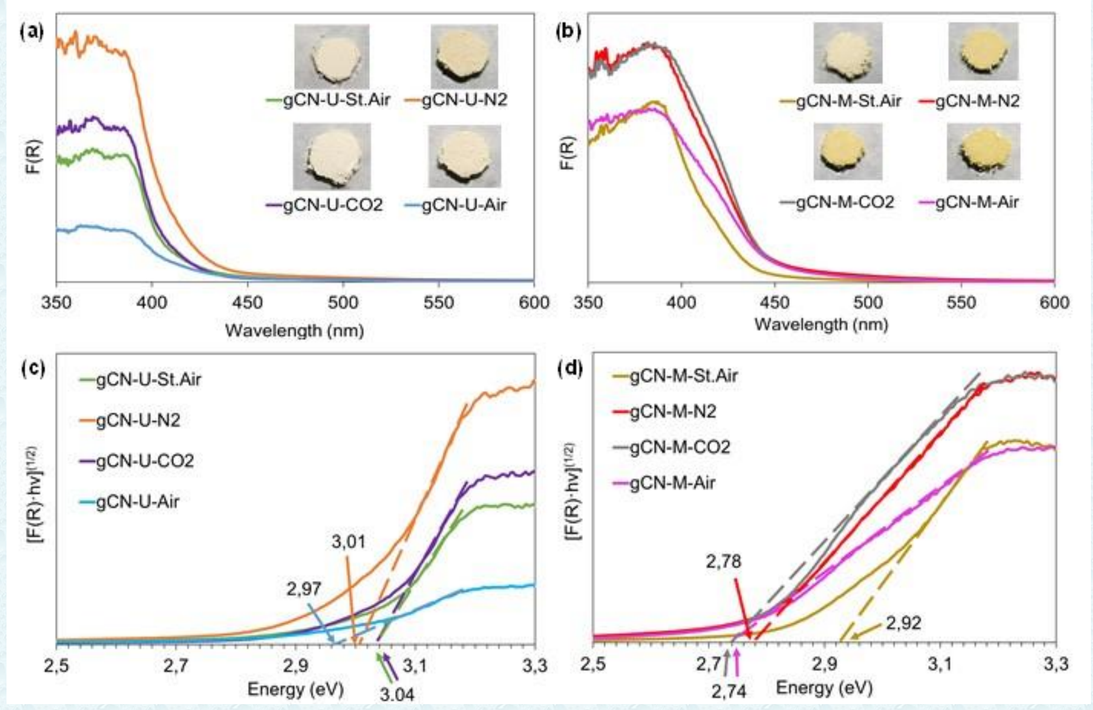
RESULTS AND DISCUSSION



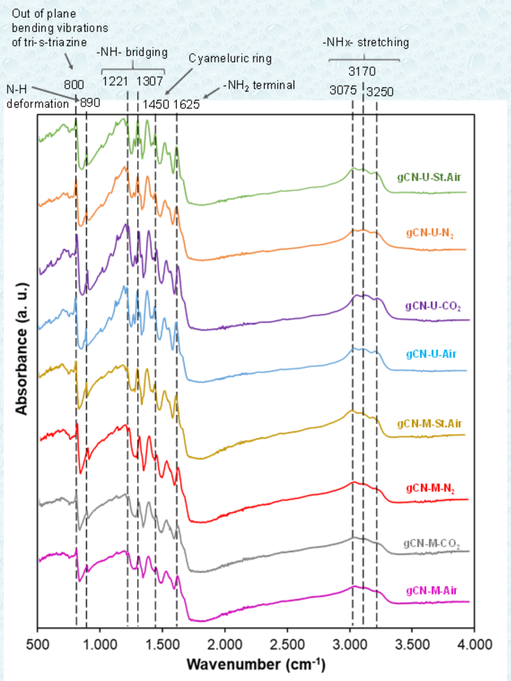




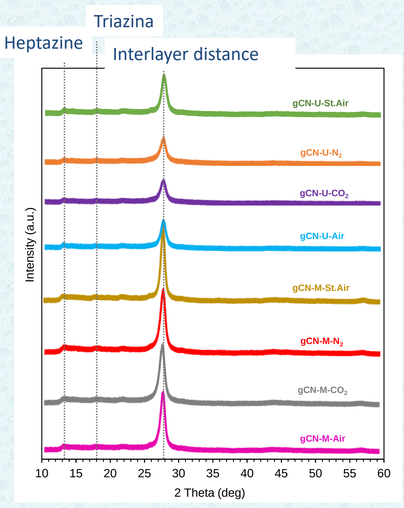




Band gap

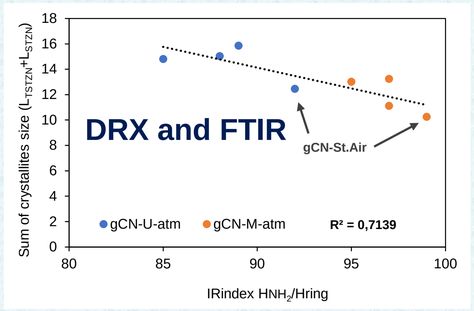


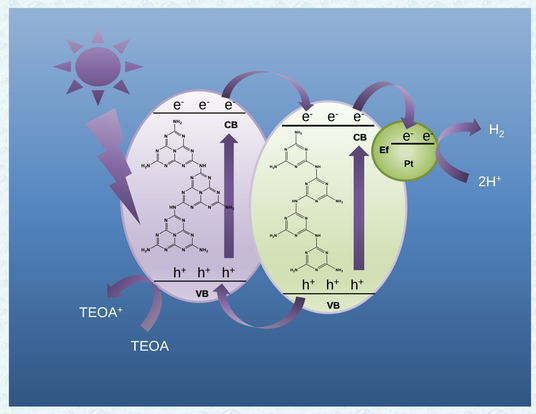
FTIR spectroscopy

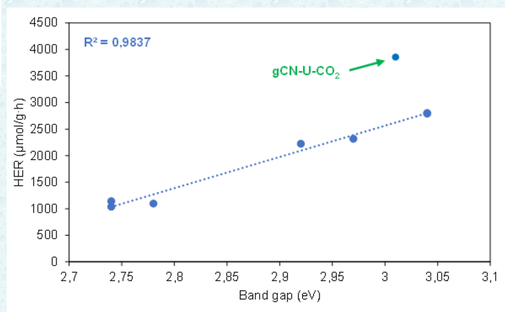


DRX

g-CN from urea have a greater polymerization degree than those from melamine







The samples that produced the most H_2 exhibited the largest band gaps

Reaction mechanism proposed is based on the isotype tri-s-triazine/s-triazine based gCN heterojunction

CONCLUSIONS

- **High band gap values, which could be related to greater presence of s-triazine structures in the photocatalyst, gave rise to higher HER values.**
- **The presence of bridging amines (-NH-) and terminal amines (-NH_2) may improve the performance of the photocatalyst.**

ACKNOWLEDGEMENTS

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