# A novel disulfide and ibuprofen functionalized crosslinker for controlled delivery from hydrogels

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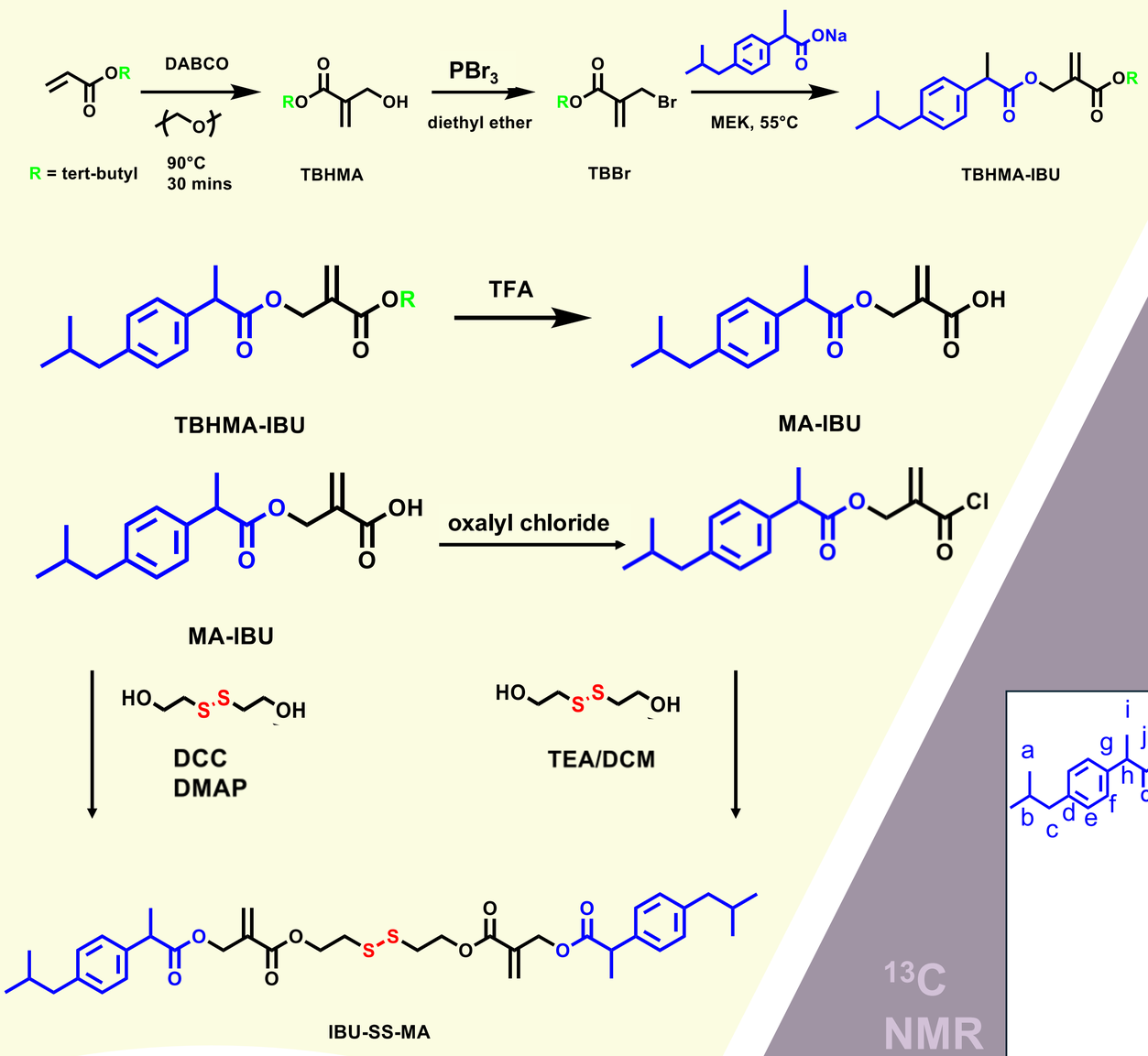
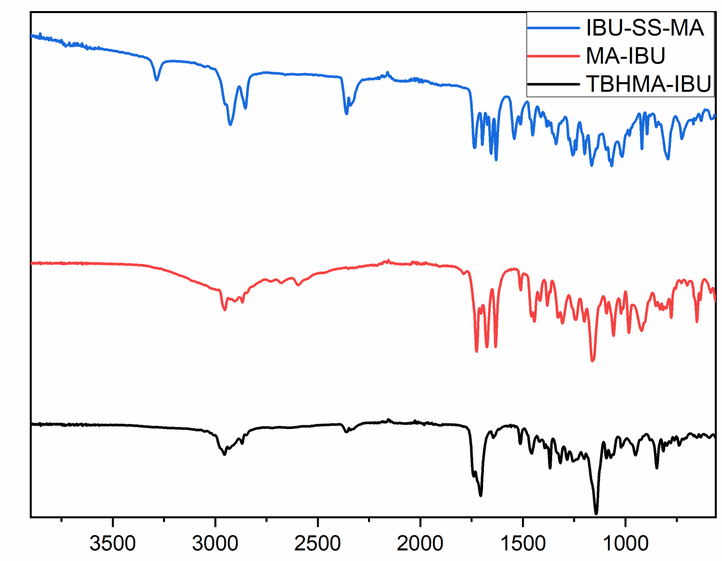
## SYNTHESIS

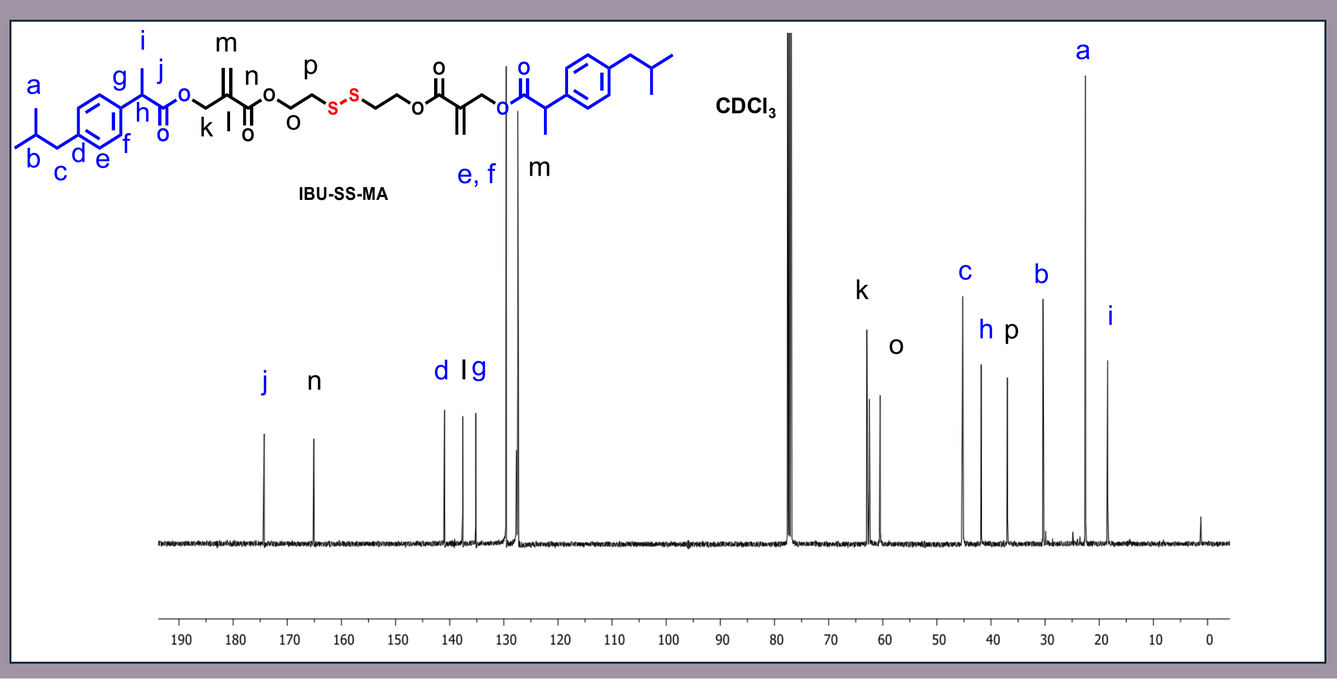



## CHARACTERIZATION

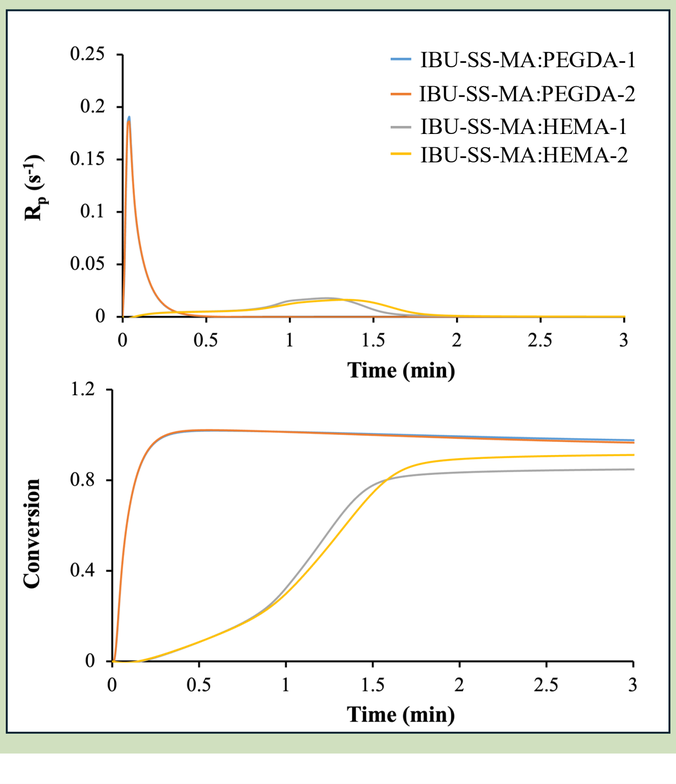
### FTIR



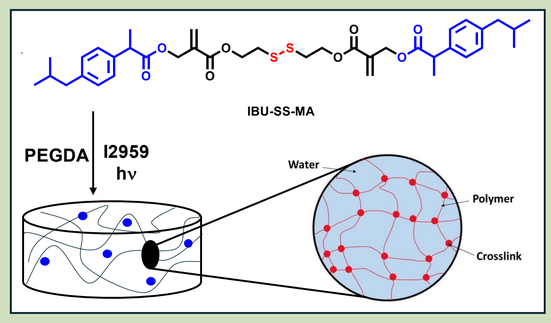

### $^{13}C$ NMR




## DSC ANALYSIS




## HYDROGEL FORMATION

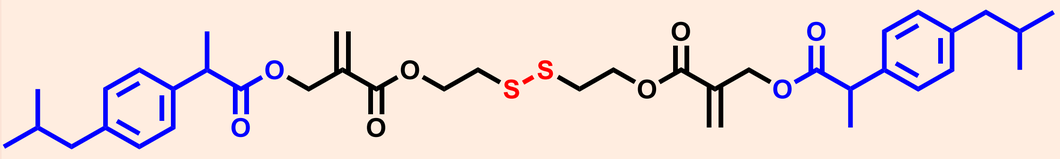



| HYDROGEL SAMPLE | IBU-SS-MA (wt%) | PEGDA (wt%) |
|---|---|---|
| 1 | 10 | 90 |
| 2 | 30 | 70 |
| 3 | 50 | 50 |

Table 1. Composition of hydrogels

## Problems of Ibuprofen:

- low water solubility
- low bioavailability
- serious side effects




## Aim:

A novel crosslinker for ibuprofen releasing hydrogels:

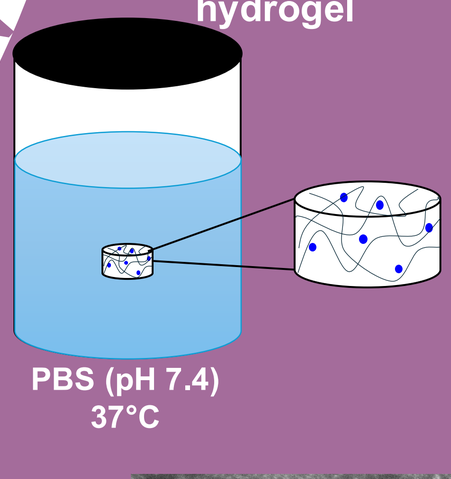
✓double ibuprofen functionality

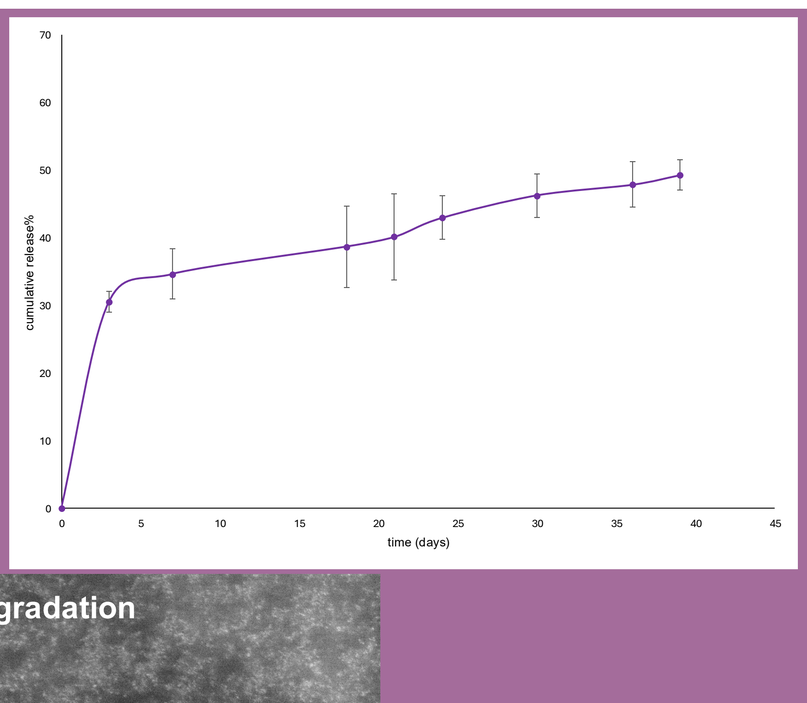
✓ redox-responsive disulfide bond

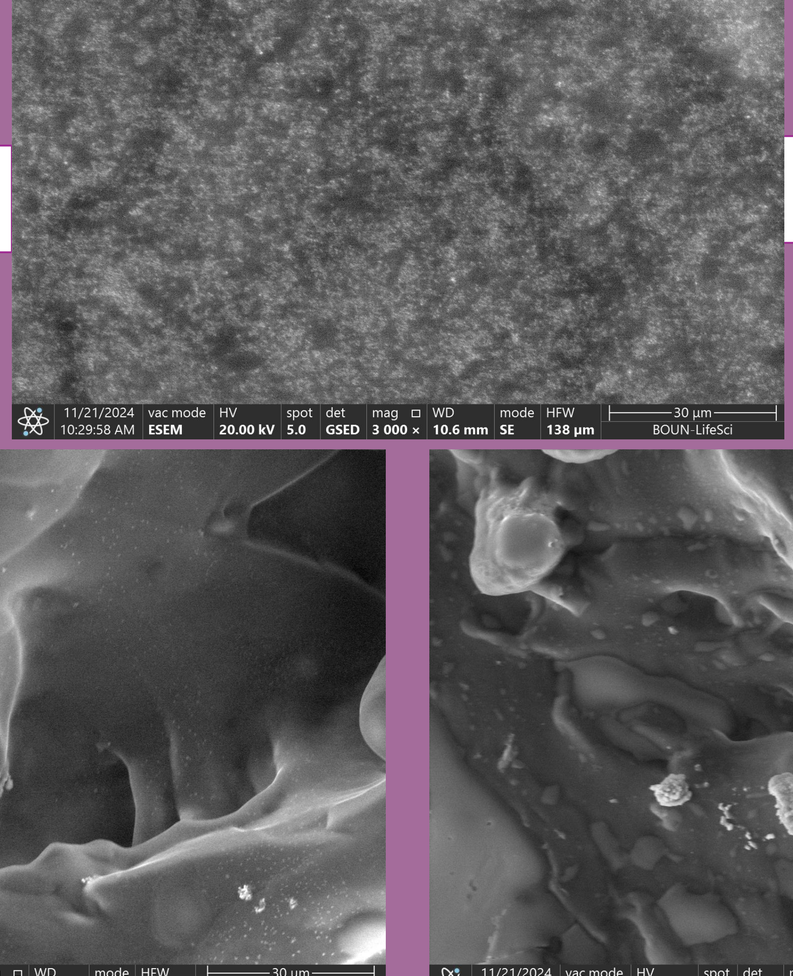
✓biocompatibility

✓good photopolymerizability

## RELEASE AND DEGRADATION




**PBS (pH 7.4) 40 days**

**25 mM GSH 40 days**







## CONCLUSION

IBU-SS-MA were used to prepare hydrogels from poly(ethylene glycol) diacrylate (PEGDA, $M_n$= 575 D). The release of IBU from the hydrogels was found to be slow, 50% in 40 days. The effect of GSH on hydrogels confirmed the redox-responsiveness.

**Acknowledgement**

The authors would like to acknowledge financial support from Bogazici University (BAP/ADP 50003).