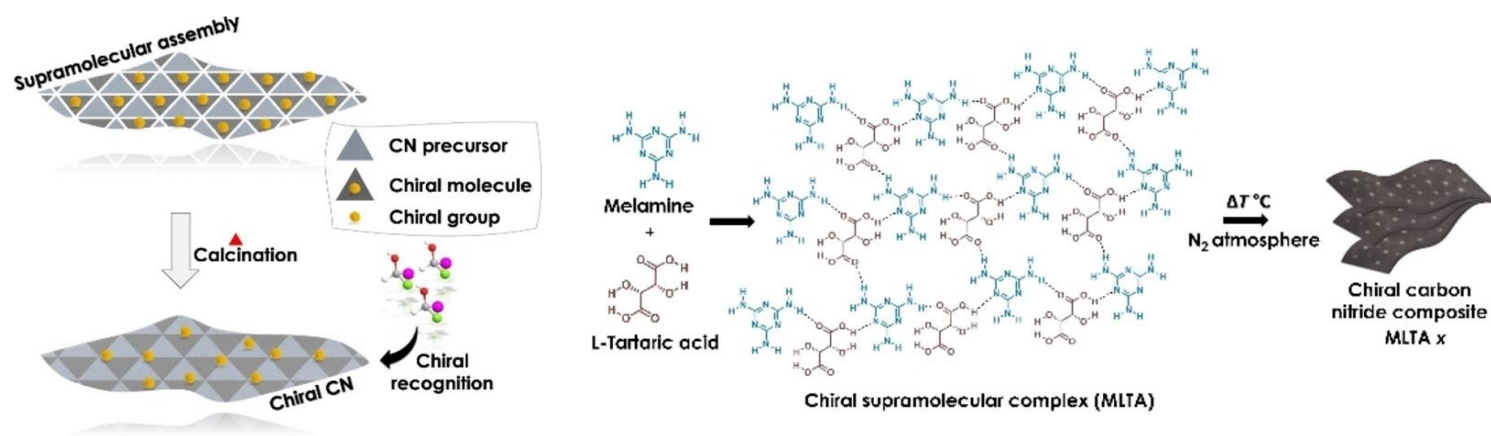


## Polymeric Carbon Nitride with Chirality Inherited from Supramolecular Assemblies

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### Who are the corresponding authors and what are their research areas?

**Yitzhak Mastai** (Department of Chemistry - Bar-Ilan University) is specialized in chirality at the nanoscale and in nanotechnology.

- ✧ 1999 He received his Ph.D, under the supervision of Prof. Gary Hodes, on Nanomaterial at Weizmann Institute of Science, .
- ✧ 1999-2003 as post-doctoral Fellow, Max Planck Institute of Colloids and Interfaces (MPI), working with both Prof. Markus Antonietti and Prof. Helmut Cölfen on Biomimetic Chemistry and Chiral Polymers.
- ✧ 2003-then Chemistry Department at Bar Ilan University (BIU), Professor of Nanotechnology and Chemistry, leading the Chirality Nanoscale laboratory

**Menny Shalom** (Ben-Gurion University of the Negev) focusing on new synthetic methodologies for 2D metal-free materials, sustainable solar to fuel conversion, and the development of new materials and concepts for clean fuel production (e.g., hydrogen and carbon-based fuels) by using photoelectrochemical cells and electrocatalysis

- ✧ He received his Ph.D Bar Ilan University, under the supervision of Prof. Arie Zaban at BIU.
- ✧ He did postdoctoral research in MPI, with Prof. Markus Antonietti.
- ✧ 2013-2016 Group Leader at MPI.
- ✧ 2016-then Ben-Gurion University of the Negev, Department of Chemistry.

### What is the main claim of the article?

The authors reported the synthesis of chiral CN. The chirality of the precursors was preserved and imprinted in the material after calcination. They examined the ability of enantioselective recognition of the material and also tested the potential to synthesis in large scale and to synthesis CN electrodes.

This work for the first time reported chiral CN.

### **How is it demonstrated?**

The structure of the material MLTA x and the reaction pathway were carefully demonstrated and most importantly they examined the chiral nature of MLTA x by:

- ❖ a series of chiral selective adsorption experiments based on circular dichroism (CD) spectroscopy
- ❖ isothermal titration calorimetry (ITC): to measure the adsorption enthalpy of the two enantiomers.
- ❖ X-ray photoelectron spectroscopy (XPS) depth profile measurements: to investigate the chemical environments of C and N and to understand the chiral behavior of the surface and bulk of the material

To explore the chiral nature of the MLTA 350/FTO electrode:

- ❖ a set of cyclic voltammetry (CV) experiments with solutions of L-TA or D-TA

### **What are the typical experimental conditions?**

melamine (4 mmol) and L-TA was mixed in a 2:1 mass ratio and then shaken in water overnight and then centrifugated to isolate the powder of chiral supramolecular assembly melamine-L-tartaric acid (MLTA). The supramolecular complexes was then treated at different temperatures from 300 °C to 550 °C. And they finally chose 350 °C when the chirality was preserved best.

### **Which are the key related papers?**

- L. Yin, S. Wang, C. Yang, S. Lyu, X. Wang, Modulation of Polymeric Carbon Nitrides through Supramolecular Preorganization for Efficient Photocatalytic Hydrogen Generation. *ChemSusChem* 2019, 12, 3320–3325.
- Sapir Shekef Aloni, Milena Perovic, Michal Weitman, Reut Cohen, Martin Oschatz, Yitzhak Mastai\*. Amino acid-based ionic liquids as precursors for the synthesis of chiral nanoporous carbons. *Nanoscale Adv.* 2019 Nov 16; 1(12): 4981-4988.
- J. Barrio, M. Shalom, Rational Design of Carbon Nitride Materials by Supramolecular Preorganization of Monomers. *ChemCatChem* 2018, 10, 5573–5586.