

# Kaan Karaca

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## EDUCATION

**M.Sc., Chemistry, Bilkent University, Faculty of Science**  
CGPA 3.87/4.00

Ankara, Turkey  
2022-Present

**B.Sc., Chemistry, Bilkent University, Faculty of Science**  
CGPA 3.24/4.00  
Ranked as 4<sup>th</sup> among 2022 cohort

Ankara, Turkey  
2018-2022

**TED Ankara College Foundation High School**  
Graduation grade: 88.39/100

Ankara, Turkey  
2014-2018

## EXPERIENCE

### RESEARCH EXPERIENCE

#### Özensoy Research Group

Graduate Research Assistant at Özensoy Research Group

Ankara, Turkey  
2022-Present

- 3 years of experience in applied catalysis lab
- 1 year of experience in photocatalysis lab

Projects:

1. Understanding Photocatalytic Reaction Mechanism of Methanol Selective Oxidation to Formaldehyde at the Molecular Level using Atomically-Ordered and Shape-Defined Nanocrystal Catalysts
  - **Proposed and planned** AP-XPS and AP-XANES/AP-NEXAFS experiments to elucidate the morphology dependent electronic alterations during methanol partial oxidation
  - **Surface Analysis:** Designed, conducted and analyzed CO, NO, N<sub>2</sub>O and Methanol adsorption experiments by custom made in-situ FTIR and TPD
  - **Reactor Design:** Custom made liquid phase photocatalytic reactor
  - **Synthesis:** Shape-defined Cu<sub>2</sub>O microcrystal catalysts
  - **Characterization:** ATR-FTIR, XRD, XPS, SEM, EDX
  - Quantification of reaction products by UV-Vis Spectroscopy
  - Activity measurements
2. Influence of Electron Transfer Processes Between Active Metal Sites and the Support Material in Single-Atom-Catalysts and Ultra-Finely Dispersed Cluster Catalysts on Heterogeneous Catalytic Structure-Functionality Relationships
  - **Synchrotron:** Conducted XANES and NEXAFS measurements on various catalysts at SESAME
  - **Surface Analysis:** CO Adsorption experiments by custom made in-situ FTIR
  - **Synthesis:** Single atom/single site catalysts
  - **Characterization:** ATR-FTIR and XRD

Undergraduate Research Assistant at Özensoy Research Group

2021-2022

Senior Project: Synthesis and Characterization of High Dispersion Ni/Hydroxyapatite Catalyst Promoted with Fe and K

- **Synthesis:** Hydroxyapatite with different dopants using co-precipitation method
- **Characterization:** ATR-FTIR, XRD, XPS and H<sub>2</sub>-TPR
- **Surface Analysis:** CO and Ethanol Adsorption experiments by custom made in-situ FTIR and TPD

### TEACHING ASSISTANTSHIP EXPERIENCE

#### Bilkent University, Faculty of Science

Teaching Assistantship

Ankara, Turkey  
2022-Present

- Analytical Chemistry II Lab (2022-23 Fall)
- General Chemistry II Lab (2022-23 Spring)
- General Chemistry I Lab (2023-24 Fall)

## INDUSTRY EXPERIENCE

### **Eczacıbaşı Consumption Products**

Competed in the “EnGenius 2022” innovation competition

İstanbul, Turkey

March 2022

- Design and Production of Bio-Friendly Cleaning Paper
- Produced a cleaning paper and a biodegradable package made out of cellulose from the solid wastes of olive industry with my team PAPoWER.

### **Roketsan**

Summer intern at one of the most prestigious defense company in Turkey

Ankara, Turkey

14.06-10.08.2021

Research and development department (chemical material technologies department)

- Development process of explosive materials and rocket fuels
- Determination of purity percentage by HPLC
- Purification of solid products by vacuum filtration, rotary evaporation and drying
- Synthesis of various materials
- Gel Permeation Chromatography (Theory)
- LD-Class Pump installation

## SKILLS AND ABILITIES

**Programming languages:** Python (Basic)

**Data analysis and graphics software:** OriginLab

**Languages:** English (professional proficiency), German (basic), Italian (basic), Turkish (native)

**Laboratory Instruments:** Custom made in-situ FTIR, FTIR, ATR-FTIR, SEM, EDX, XRD, XPS, Mass Spectrometry, Flow-reactor, UV-Vis Spectroscopy