

**Sustainable Water Management  
Doctoral Programme (Water4All)**



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<b>Title of the PhD Project</b>	Synthesis of polyols for the fabrication of various types of polyurethanes for coating of complex-shaped substrates
<b>Acronym</b>	PoOL
<b>Research Fields of the Project</b>	Chemistry, Chemical Engineering, Material Science and Engineering
<b>Keywords</b>	Solventless polyurethane, biocompatible, clean water
<b>Host Institution, Department and Campus Location</b>	Izmir Institute of Technology, Department of Materials Science and Engineering, Urla/Izmir
<b>PhD Awarding Institution and Graduate Programme</b>	Izmir Institute of Technology, Graduate School, PhD in Materials Science and Engineering
<b>Name and Affiliation of Main Supervisor</b>	Prof. Dr. Mustafa M. Demir (IZTECH)
<b>Name and Affiliation of Co-Supervisors</b>	Dr. Merve Demirkurt (Kanat Paint & Coatings)
<b>Research Environment and Infrastructure</b>	The selected candidate will have access to the research infrastructure available at IZTECH. IZTECH has an integrated research center that includes twelve independent centers such as Materials Research Center, Nuclear Magnetic Resonance Center, Environmental Research and Development Center, etc. These centers have the required infrastructure to conduct this particular project.  <a href="https://tam.iyte.edu.tr/en/iztech-irc/">https://tam.iyte.edu.tr/en/iztech-irc/</a>
<b>Scientific Context of the Project</b>	Kanat Paint & Coatings has been an active world-wide company for more than 30 years. It has produced various types of polymeric coatings such as epoxy, alkyd, and polyurethane for many different sectors. The majority of the raw materials has been imported, which is the biggest obstacle the company has been faced with. The synthesis of polymer and their precursors is a real challenge for the company. In this particular project, the synthesis of polyols for polyurethanes synthesis is aimed.



<p><b>Brief Workplan</b></p>	<p>The main aim of this thesis is to develop novel Polyurethane coatings that can be used for the inner surface of the metallic water pipelines. Various types of polyol structures were designed and synthesized. The thickness of the coating, time for crosslinking, and environment-dependent properties of nanostructured biocompatible film. The tentative yearly workplan is presented below:</p> <ul style="list-style-type: none"> <li>• <b>1 st Year</b> Synthesis of polyols</li> <li>• <b>2 nd Year</b> Synthesis and characterization of polyurethanes: Kinetics of polym'n.</li> <li>• <b>3 rd Year</b> Application of the PU on various surfaces</li> </ul>
<p><b>Innovative Aspects of the Project</b></p>	<p>The outcomes of the project will help develop innovative and feasible design for environmentally benign polyurethane coatings on complex shaped substrates. For the application of the coatings in the field requires controllable curing time and biocompatible film structure over concave shape of the stainless steel pipelines.</p>
<p><b>Training Opportunities of the Project</b></p>	<p>The selected candidate will be offered various training opportunities in the convergence of chemistry, materials science, process engineering. The supervisory team and student will discuss and form a training plan at the start of the PhD, considering both personal interests and scientific needs.</p>
<p><b>Interdisciplinary Aspects</b></p>	<p>The selected candidate will be supervised by two experts in polymer chemistry and materials science and engineering. He/she will be working towards addressing multifaceted and multidisciplinary sub-topics that sit at the intersection of chemistry, advanced materials and process engineering</p>
<p><b>Intersectoral Mobility</b> <input type="checkbox"/> Short Visit <input checked="" type="checkbox"/> Secondment</p>	<p><b>Host</b> Kanat Paint &amp; Coatings <b>Context of Mobility</b> Entrepreneurship Training, Thematic Pre-incubation Program</p>
<p><b>Intersectoral Mobility</b> <input checked="" type="checkbox"/> Short Visit <input type="checkbox"/> Secondment</p>	<p><b>Hosts</b> i) Kanat Paint &amp; Coatings ii) Taherna</p>
<p><b>International Academic Secondment</b></p>	<p>Host Supervisor: Prof. Rafael Munoz Espi Host Institution: University of Valencia, Spain Host Department: Department of Chemistry</p>



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	Duration: 6 months Estimated Time of Mobility: 2 nd Year
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Main Supervisor										
<b>Brief CV</b>	<p><b>Prof. Dr. Mustafa M. DEMİR</b></p> <p>E-mail: <a href="mailto:mdemir@iyte.edu.tr">mdemir@iyte.edu.tr</a></p> <p><b>Academic Degrees</b></p> <table><tr><td>Ph.D.</td><td>Materials Sciences and Engineering, Sabancı University, Türkiye</td><td>2004</td></tr><tr><td>M.Sc.</td><td>Materials Sciences and Engineering, Sabancı University, Türkiye</td><td>2001</td></tr><tr><td>B.Sc.</td><td>Chemistry, Boğaziçi University, Türkiye</td><td>1999</td></tr></table> <p><b>Professional Networks</b></p> <p>Google Scholar: <a href="https://scholar.google.com/citations?user=OX8Cq2wAAAAJ&amp;hl=en">https://scholar.google.com/citations?user=OX8Cq2wAAAAJ&amp;hl=en</a></p> <p>ResearchGate: <a href="https://www.researchgate.net/profile/Mustafa-Demir-10">https://www.researchgate.net/profile/Mustafa-Demir-10</a></p> <p>Scopus: <a href="https://www.scopus.com/authid/detail.uri?authorId=13907034500">https://www.scopus.com/authid/detail.uri?authorId=13907034500</a></p> <p>ORCID: <a href="https://orcid.org/0000-0003-1309-3990">https://orcid.org/0000-0003-1309-3990</a></p>	Ph.D.	Materials Sciences and Engineering, Sabancı University, Türkiye	2004	M.Sc.	Materials Sciences and Engineering, Sabancı University, Türkiye	2001	B.Sc.	Chemistry, Boğaziçi University, Türkiye	1999
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Co-supervisors										
<b>Brief CV</b>	<p><b>Dr. Merve DEMİRKURT</b></p> <p>E-mail: <a href="mailto:merved@kanatboya.com.tr">merved@kanatboya.com.tr</a></p> <p><b>Academic Degrees</b></p> <table><tr><td>Ph.D.</td><td>İzmir Institute of Technology, Türkiye</td><td>2022</td></tr><tr><td>M.Sc.</td><td>İzmir Institute of Technology, Türkiye</td><td>2017</td></tr><tr><td>B.Sc.</td><td>İzmir Institute of Technology, Türkiye</td><td>2014</td></tr></table>	Ph.D.	İzmir Institute of Technology, Türkiye	2022	M.Sc.	İzmir Institute of Technology, Türkiye	2017	B.Sc.	İzmir Institute of Technology, Türkiye	2014
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