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# 2021 WORLD FUEL CELL CONFERENCE

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Name	Linfa Peng	
Affiliation	Shanghai Jiao Tong University	
<h2 style="color: red;">Invited Keynote Lecture</h2>		
Presentation Title	<b>Manufacturing of thin metallic bipolar plate for PEM fuel cells: development of forming and coating processes</b>	
Abstract (Approximately 200 words)	<p>The industrial applications of PEMFC have attracted tremendous capitals and research attention. Due to the unique advantages of ultra-thin, high strength, easy-to-mass-produce, etc., metallic bipolar plates (BPs) are the promising solution for the applications requiring high power density. To realize both high density and long durability, many challenges remain to be conquered for metallic BPs. The gap between BP design and manufacturing is the first fundamental issue. The multi-stage forming is adopted to realize optimized BP designs of large-area micro channels with a higher aspect ratio. Based on a systematic investigation on the deformation, friction and fracture mechanics at micro/meso scale, the coupling effects of material, plastic mechanics, loading conditions, geometric factors, etc. in the multi-stage forming were explored. An optimization roadmap of formability, springback and accuracy of metallic BPs was also given. Additionally, the conductivity, corrosion and ion emission resistance of metallic BPs require a coating with both high performance and low cost. Many candidates such as pure carbon, doped carbon and noble metals were investigated. The mechanisms of how the different coating elements and microstructures affecting the mechanical, electrical and electrochemical performances of BPs were investigated. The coating design, evaluation and fabrication towards industrialization are also discussed.</p>	
Biographical Sketch (Approximately 200 words)	<p>Linfa Peng is a full professor at the State Key Laboratory of Mechanical System and Vibration in Shanghai Jiao Tong University. He also works as the deputy director of the youth working committee and a member of the micro/nano fabrication branch of the China Society for Technology of Plasticity. He is a winner of the Excellent Young Scientists Fund of the National Natural Science Foundation of China. He is also entitled a distinguished Young Professor of Chang Jiang Scholars Program by the Chinese Education Ministry. His research interests include micro/meso metal forming process and new-energy equipment development. The metallic BP manufacturing technologies developed by Prof. Peng have been widely applied in the fuel cell cars developed by SAIC, SRP, GAC, GWM, etc. He has won the 2015 Natural Science Award (First Class) of Chinese Education Ministry, the 2017 Automobile Industrial Invention Award (First class) of China Society of Automobile Engineers and the 2019 Shanghai Technical Invention Award (Special Prize).</p>	