

Fundamentals and Applications by natural energy and mass transport substance CO₂

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Abstract: In the context of global energy conservation and emission reduction, building a new energy system that utilizes carbon dioxide as energy and mass transport substances is of great significance. The transcritical carbon dioxide cycle has inherent advantages in the construction of many renewable energy systems due to its critical characteristics, which also leads to many studies on the basic theory and practical application of the transcritical carbon dioxide cycle. In this topic, these aspects and results are summarized to benefit the in-depth understanding and further promotion using CO₂ high efficient energy and mass transport substance.



Short bio: Xin-Rong Zhang, professor, doctoral supervisor in the College of Engineering, Peking University. Director of Beijing Engineering and Technology Research Center for Urban Thermal Management, and president of Beijing Energy Society. He is a famous research scientist in the field of natural working fluid thermodynamic cycle and heat transfer, and the founder CO₂ power generation, CO₂ thermodynamic cycle of refrigerating and heating. He has made pioneering research achievements in the fields of supercritical fluid dynamics and heat transfer, phase transition heat transfer of micro and nanoparticles, and new functional fluid materials. In recent years, his research mainly focuses on cold chain and storage of fresh edible agricultural products, the conversion and utilization of renewable thermal energy, and efficient utilization of cold and hot energy in construction and industrial processes. He proposed the concept of super cold chain with carbon dioxide efficient thermodynamic circulation technology firstly in the world, building a long-term preservation system with high quality, low energy consumption and green environmental protection. And developed the serialized in-depth processing technology of agricultural products to enhance the added value of agricultural products. He has published more than 180 papers in international journals, and authorized and applied for more than 70 patents. He was selected in the "Career influence" and "Annual Influence" list of the top 2% top scientists, and won many honorary titles such as High cited Scholar in Elsevier Energy Field, First Prize of Beijing Science and Technology Progress, and Individual with Outstanding Contribution to the Winter Olympics.

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