Statistical entropy analysis of carbon dioxide low-temperature transcritical cycles

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The article considers the results of comparing operational efficiency of carbon dioxide transcritical cycles used in refrigeration systems for retail enterprises. We selected the thermodynamic degree of perfection as the estimation criterion during comparison, and analysed refrigeration systems using the statistical entropy method. As input data, we selected parameters taken into account when designing refrigeration plants. We supply circuit diagrams of the refrigeration systems considered and equations for calculating the minimum work required to compensate for entropy production in the refrigerator nodes. The analysis results made it possible to define ways of further optimising the retail refrigeration system.

Keywords: *statistical entropy analysis, thermodynamic analysis method, transcritical cycle, carbon dioxide, carbonic acid gas, retail refrigeration systems*

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