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SYSTEM ENGINEERING

化学过程全性总体优化产品和环境经济性集成研究

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概述内容：随着环境 和谐社会的日益 强化的要求，

提要：With the increasing public consciousness on environmental issues, chemical products and process designs require simultaneous satisfaction and compromise of environmental and economical requirements. To fulfill the two con-flicting while complementary objectives, a systematic approach for life cycle design of a chemical product is proposed in this article. Multi-attribute decision-making is adopted in a trade-off consideration of both technical economical evaluation and environmental impacts assessment using the analytic hierarchy process (AHP) approach. On the basis of an evaluation of the relative importance of the criteria multicriteria decision making is performed. In this study, an AHP model is used to derive weight a criteria score by analyzing the environmental impact and life cycle cost of a product, respectively. And a Euclaucr weight analysis is put forth to calculate the integrated index of the product to enable products to be ranked or selected intuitionally and conveniently. The proposed AHP model has been applied in a case study, a comparative study on chamber cleaning with NF3 and C2F6. The results show that the proposed AHP model is capable of providing a rational and relevant evaluation.

关键词：life cycle assessment; life cycle cost; analytic hierarchy process; chemical product;

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Integrated assessment of environmental and economic performance of chemical products using analytic hierarchy process approach

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Abstract With the increasing public consciousness on environmental issues, chemical products and process designs require simultaneous satisfaction and compromise of environmental and economical requirements. To fulfill the two con-flicting while complementary objectives, a systematic approach for life cycle design of a chemical product is proposed in this article. Multiattribute decision-making is adopted in a trade-off consideration of both technical economical evaluation and environmental impacts assessment using the analytic hierarchy process (AHP) approach. On the basis of an evaluation of the relative importance of the criteria multicriteria decision making is performed. In this study, an AHP model is used to derive weight a criteria score by analyzing the environmental impact and life cycle cost of a product, respectively. And a Euclaucr weight analysis is put forth to calculate the integrated index of the product to enable products to be ranked or selected intuitionally and conveniently. The proposed AHP model has been applied in a case study, a comparative study on chamber cleaning with NF3 and C2F6. The results show that the proposed AHP model is capable of providing a rational and relevant evaluation.

Key words life cycle assessment; life cycle cost; analytic hierarchy process; chemical product;

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