

# Energy consumption reduction in phosphoric acid production by wet process

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Wet method of phosphoric acid production is economically sound now days. It is characterized by low energy consumption in comparison has thermal method and with simple extractive purification of finished product [1].

In this work real working process of the phosphoric acid production by dihydrate method is described. Process flowsheet analysis have shown low heat integration and pinch crossing. Application of process integration methods gives reduction of energy consumption and improvement of environment situation.

Process streams that may be included to heat integration were defined. Material and heat balances of existing process were determined. Studying of heat recovery system allowed to define value of existing energy recuperation ~ 0.9 MW. It give the possibility to build composite curves of existing process streams and to define hot utilities consumption ~ 9.1 MW and cold utilities consumption ~ 12 MW.

Retrofit project of heat exchanger network may be considered as grassroot because very low heat recovery in existing process is presented. Optimal  $\Delta T_{\min}$  for market energy prices was defined. Energy saving potential of existing phosphoric acid production by wet method is amounted to 2.2 MW for hot utilities and 3.14 MW for cold utilities. This difference is concerned with changing of the process stream heat capacity.

Flowsheet of retrofit project was developed for energy targets. Payback period of the offered heat exchanger network is 1.91 year.

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## References

1. Beglov B.M., Zhekeyev M.K. Perspectives of phosphorous, fertilizers, salts production of different application with use of phosphoric acid. // Chemical Industry. 2002. No 4, p. 1–3.