



BANGICID IN DETERGENTS DESCALING

Description

BANGICID ($C_3H_6O_3$) is a weak organic acid which plays a role in several biochemical processes.

BANGICID is used in a wide range of industrial applications. The detergents industry is subjected to some requirements like safety, effectiveness and environmentally friendly ingredients. Due to his excellent descaling property, **BANGICID** is well-suited to detergents applications such as machine descalers and more generally household cleaners.



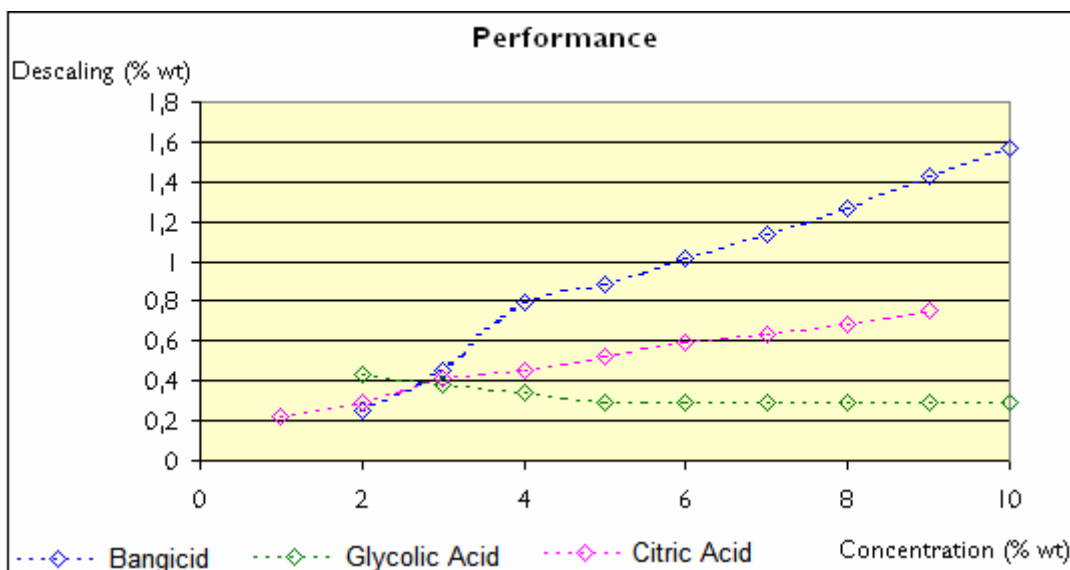
Properties & Benefits

Limescale is a problem in heated water systems. It is formed primarily because the solubility of calcium carbonate decreases with increasing temperature. There are many devices on the market for the removal of such limescale. A simple solution is to use descaler such as **BANGICID**. **BANGICID** is the best descaling agent compared with other safe organic acids (i.e. glycolic or citric acid). **BANGICID** is twice more active than citric acid and moreover it is the most cost-effective safe organic acid.

1. Influence of concentration

In order to evaluate the descaling property of several acids the marble block test was performed: a block of marble was submerged during 15 minutes in solution of acid at different concentrations. The block is weighed before and after the test.

Graph I.1 shows the linearly dependent of **BANGICID** on concentration. The reason is the calcium salt inhibits performance of citric and glycolic acids.



Graph I.1: linearly dependent of BANGICID on concentration

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Anhui BBGA & GALACTIC Lactic Acid Co., Ltd.

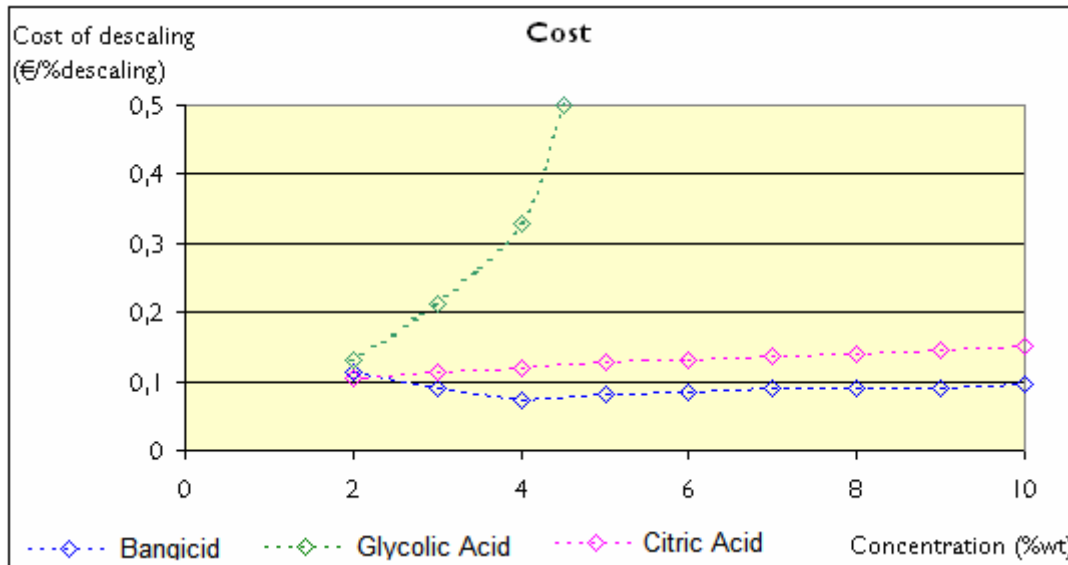
No.73 Daqing Road, Bengbu, Anhui, China. Tel: +86 552 2081288, Fax: +86 552 2081299

Website: <http://www.bglactic.com>



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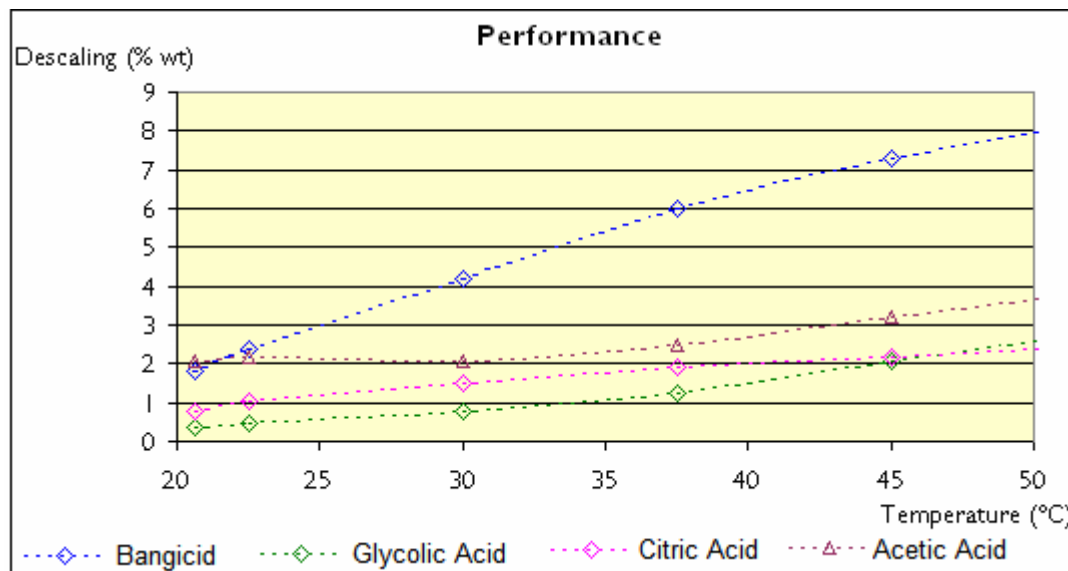
Graph 1.2 clearly proves the cost-effectiveness of **BANGICID**. In order to obtain the same effect, you need less quantity of **BANGICID**.



Graph 1.2: cost-effectiveness of BANGICID (concentration dependent)

2. Influence of temperature

Solutions of acids (10%) were experienced at several temperatures. **BANGICID** compared to citric, acetic and glycolic acids is very active at high temperature and the descaling cost of **BANGICID** is the lowest. Consequently **BANGICID** is well-suited in hot descaling processes.

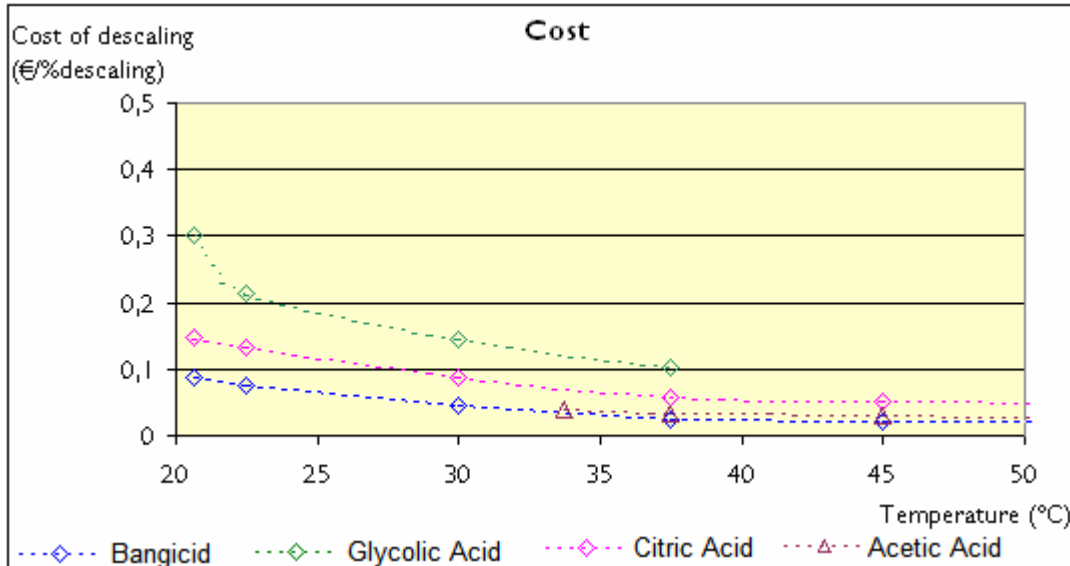


Graph 2.1: linearly dependent of BANGICID on temperature



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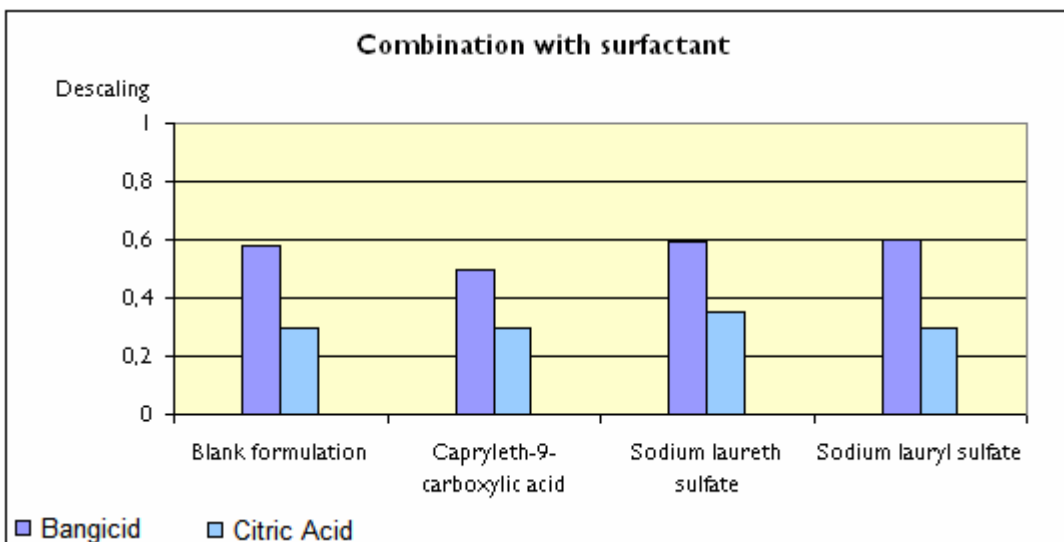
Comparing with Glycolic acid, Citric acid, and Acetic acid, **BANGICID** is the most cost-effective solution for hot descaling processes (Graph 2.2).



Graph 2.2: cost-effectiveness of BANGICID

3. Combination with surfactants

The marble test was performed again with 10% solutions of lactic and citric acid at pH=3 containing 2% of surfactants. This comparison demonstrates that **BANGICID** is twice more active than citric acid and is not affected by the surfactant (Graph 3.1).



Graph 3.1: synergic with surfactants

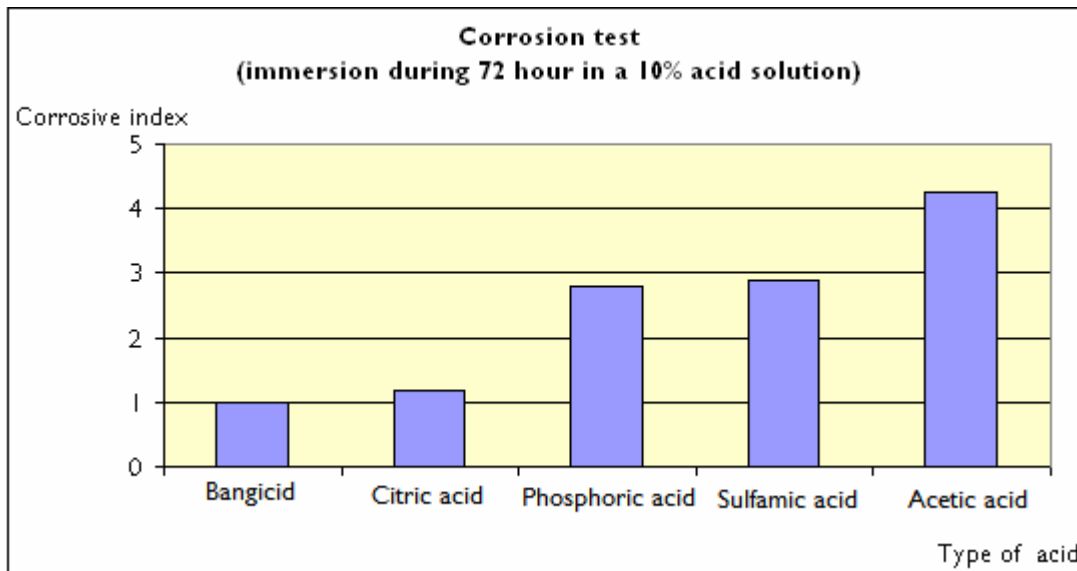


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4. Corrosion test

Different acids can be used as descaler agent. Those acids can corrode the metal pieces of coffee machine. The behavior of the acids can be seen by an immersion test of a small piece of metal in different acids. To compare the effect of different acids, we have submerged small brass pieces in a 10% acid solution during 72 hour. We have tested five different acids: **BANGICID**, citric, phosphoric, sulfamic and acetic acids.

Graphs 4.1 represent the corrosive index. This index represents the loss of copper and zinc during the immersion. At the end of the test we have measured the loss of zinc and the loss of copper by the action of different acids. The sum of the global loss (copper + zinc) is reduced to 1 for **BANGICID**. By comparison, we can determine the corrosive index for the other acids. We can observe that inorganic acids are more aggressive on metal surfaces than organic acids. We can also observe that **BANGICID** and citric acid are the safest.



Graphs 4.1 corrosive index of different acids

Example of formulations

1 - Coffee machine descaler

Bangicid 80	6%
Akypo LF2 ¹	0.5%
Demineralised water	Until 100%

¹ Ether carboxylic acid from Kao Chemicals www.kaochemicals.de/intranet/dlfiles/lc/1/akypo.pdf