Better eco-efficiency of formates in gas drilling

- Eco-efficiency analysis confirms that formic acid salts are cost efficient and easy on the environment
- Use in completion fluids for stabilizing boreholes

Using cesium and potassium formates in completion fluids that stabilize boreholes in gas production is more eco-efficient than the application of brines based on zinc bromide, calcium bromide and calcium chloride. This is the result of an eco-efficiency analysis performed by BASF. Formates are salts of formic acid, a BASF intermediate.

The scientific study compared which of the products is better suited from the economic and ecological point of view to be used in completion fluids for stabilizing boreholes. In a life-cycle assessment, formates outperformed the bromides named above as well as calcium chloride as a lower-cost, environmentally more benign alternative. Formates achieved superior results also with respect to waste disposal: while waste bromide brine needs to be disposed of at considerable cost, formate brines are biologically degradable, which allows on-site disposal.

Completion fluids are used in gas production after the initial drilling operation to stabilize the well. Pressure in the well may exceed 1,000 bar. Special-purpose liquids are used to balance this pressure to prevent uncontrolled blowout of water or gas and a breakdown of...
the well bore. To achieve this the fluid must be of exceptionally high density – water-soluble salts like potassium and cesium formates have this density.

**Eco-efficiency analysis promotes sustainable development**

The BASF eco-efficiency analysis is a strategic tool for examining the cost and environmental impact of products, processes and entire system solutions. This method allows BASF to optimize its product portfolio for the requirements of a development which meets the needs of the present without compromising the ability of future generations to meet their own needs (Sustainable Development). To date, BASF experts have completed more than 400 eco-efficiency analyses, including third-party projects in which they shared BASF expertise with others. The eco-efficiency analysis developed by BASF and certified by German technical surveillance association TÜV seeks to compare products or processes that target identical customer benefits. This involves an overall study of alternative solutions. In a life-cycle assessment, the total cost and the ecological impact are determined, a special process is then applied to aggregate the findings and visualize them clearly. The eco-efficiency analysis as an overall process was certified in 2002 by “TÜV Rheinland,” the Rhineland technical surveillance association. The ecological assessment underlying the eco-efficiency analysis is based on DIN EN ISO 14040 and 14044.

**Formic acid – an all-rounder**

BASF’s customers use formic acid successfully in a wide range of applications. The acid helps to keep certain feeds fresh and free of salmonellae, removes paints and rust from metallic surfaces and descales kettles and boilers. In breweries and wineries it disinfects kegs, casks and barrels; applied as an auxiliary in the pharmaceutical
and crop protection industry it regulates pH values and acts as a dirt remover and disinfectant. Formic acid salts, the so-called formates, serve as high-class deicing agents and valuable auxiliaries in oil production.

About BASF’s Intermediates division
The BASF Group’s Intermediates division develops, produces and markets around the world a comprehensive portfolio of more than 600 intermediates. The most important of the division’s product groups include amines, diols, polyalcohols, acids and specialties. Among other applications, intermediates are used as starting materials for coatings, plastics, pharmaceuticals, textile fibers, detergents and crop protectants. Innovative intermediates from BASF help to improve the properties of final products and the efficiency of production processes. The ISO 9001:2000-certified Intermediates division operates plants at production sites in Europe, Asia, and the Americas. Around the globe, 2,655 employees of the division generated sales of about €2.5 billion to third parties in 2008. For more information, go to http://www.basf.de/intermediates.

About BASF
BASF is the world’s leading chemical company: The Chemical Company. Its portfolio ranges from chemicals, plastics and performance products to agricultural products, fine chemicals and oil and gas. As a reliable partner BASF helps its customers in virtually all industries to be more successful. With its high-value products and intelligent solutions, BASF plays an important role in finding answers to global challenges such as climate protection, energy efficiency, nutrition and mobility. BASF posted sales of more than €62 billion in 2008 and had approximately 97,000 employees as of the end of the year. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN). Further information on BASF is available on the Internet at www.basf.com.