Ion Exchange in the Mining Industry

ResinTech® Inc.
INNOVATIONS IN ION EXCHANGE

The acidic wastewater resulting from mining operations requires treatment in order to prevent adverse impacts to rivers and streams wastewater.

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Introduction

Mining ores and metals from the Earth has occurred since the earliest recorded history. The purification process of the extracted minerals has evolved over time. ResinTech provides products to assist the purification process with our brine purification selective ion exchange resin line, known as the SIR series.

ResinTech's SIR line includes the most advanced and efficient selective ion exchangers in the market, as well as resins and specialty media for the treatment and removal of contaminants from mining waste streams.

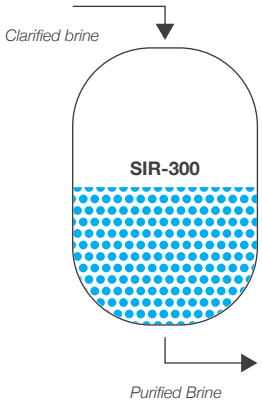
Applications

BRINE DECATIONIZATION

Mineral salt brine streams are often contaminated with trace metals and other pollutants. Some are common, such as calcium, magnesium, and iron, while others are less common, such as aluminum and vanadium. Our specialty chelating resins efficiently remove hardness from brine streams without being exhausted by sodium, and we can adjust the treatment options depending on the application.

ResinTech **SIR-300** is a weak acid cation resin with a unique chelating functionality that removes divalent transition metals preferentially to alkaline earth metals such as calcium. SIR-300 is intended for the removal of low to moderate concentrations of heavy metals from waste streams.

Brine Decationization:



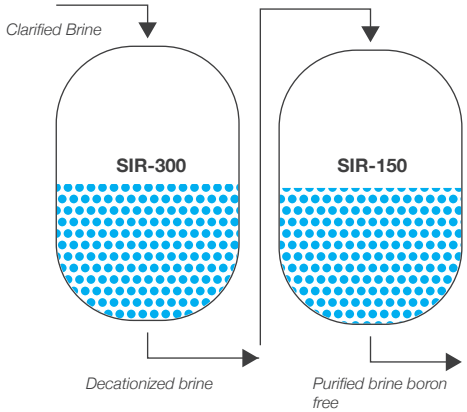
Product Name	Resin Type	Form	Water Retention	Total Capacity	Advantages
SIR-300	PS/DVB/Gel	H	50 - 60%	1.40 eq/l	Very high mechanical & chemical resistance

BRINE BORON REMOVAL

Boron is one of a number of elements present in natural salt mine brines from which lithium is extracted. Although the element has wide industrial application, boron impurities can accumulate carbonate and impede the productivity of lithium energy products.

ResinTech **SIR-150** is a borate selective weak base anion resin with a unique functionality providing exceedingly high selectivity for boron in almost any aqueous solution. When exhausted, it can be regenerated with acid and then neutralized with various alkaline salts for hundreds of service cycles. SIR-150 is intended for all borate removal applications including potable water, ultrapure water, and boron removal from concentrated lithium chloride brines.

Boron Removal:



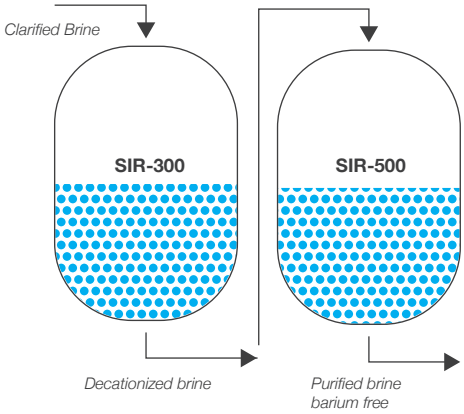
Product Name	Resin Type	Form	Water Retention	Total Capacity	Advantages
SIR-150	PS/DVB/Macroporous	Cl	46 - 60%	0.8 eq/l	Highest exchange & kinetical capacity

BRINE BARIUM REMOVAL

Barium is among the impurities affecting mineral salts brines and can be very difficult to remove. ResinTech has developed a highly efficient selective ion exchange resin capable of removing barium from mineral salt brines.

ResinTech **SIR-500** is a weak acid cation resin with a unique aminophosphonic chelating functionality and is particularly selective for alkaline earth metals such as barium and calcium. SIR-500 is intended for removal of hardness from saturated brine and for removal of divalent metals such as copper and nickel from wastewater and various process streams.

Barium Removal:



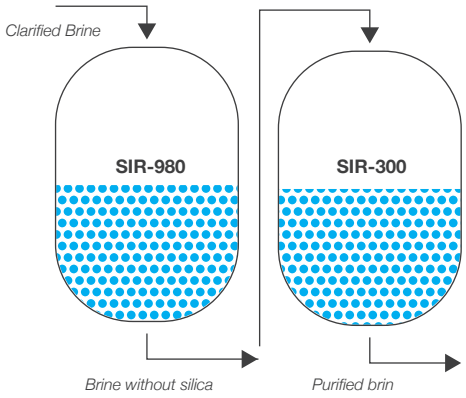
Product Name	Resin Type	Form	Water Retention	Total Capacity	Advantages
SIR-500	PS/DVB/Macroporous	Cl	50 - 70%	1.70 eq/l	Very high mechanical & chemical resistance

BRINE SILICA REMOVAL

Silica is a problematic impurity present in some mineral salts, making brine purification very difficult. ResinTech has developed a new line of hybrid ion exchangers that allow silica removal from highly concentrated brines with no silica dumping when the resin become saturated.

The **SIR-946** and **SIR-980** are a state-of-the-art development in the ion exchange resin industry. These ion exchangers are designed to work in a wide range of pH and brine concentrations for silica removal.

Silica Removal:



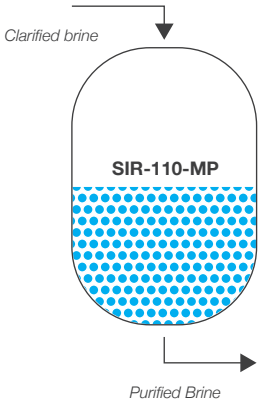
Product Name	Resin Type	Form	Water Retention	Total Capacity	Advantages
SIR-946	PS/DVB/Macroporous	Cl	48 - 60%	1.40 eq/l	Highest exchange & kinetical capacity
SIR-980	PS/DVB/Macroporous	Cl	52 - 63%	1.40 eq/l	Highest exchange & kinetical capacity

BRINE PERCHLORATE REMOVAL

Perchlorate is an emerging contaminant found in some water sources due to the use of road flares, rocket fuel, explosives and some fertilizers. Perchlorates are also found in nature and as a result can be found in highly concentrated brines.

ResinTech has developed a new ion exchanger capable of efficiently removing perchlorate present in highly concentrated brines during its purification process, and in some cases the perchlorate can be recovered. The **SIR-110-MP** is a strong base macroporous anion exchange resin able to work at a wide range of pH in highly concentrated brines.

Perchlorate Removal:



Product Name	Resin Type	Form	Water Retention	Total Capacity	Advantages
SIR-110-MP	PS/DVB/Macroporous	Cl	50 - 62%	0.80 eq/l	Very high mechanical & chemical resistance


RESINTECH INC.

Industry-leading Technical Support

Our legendary technical support team combines the world's leading IX scientists, most sophisticated laboratory, and advanced ion exchange simulation technology to solve the most challenges water quality dilemmas. We can conduct a detailed analysis of your influent or effluent, model your application's environment in a "virtual" setting, and provide product or process recommendations to ensure optimal water treatment operations for virtually any use case. Reach out to us for help at **techsupport@resintech.com** or scan the qr code below.

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