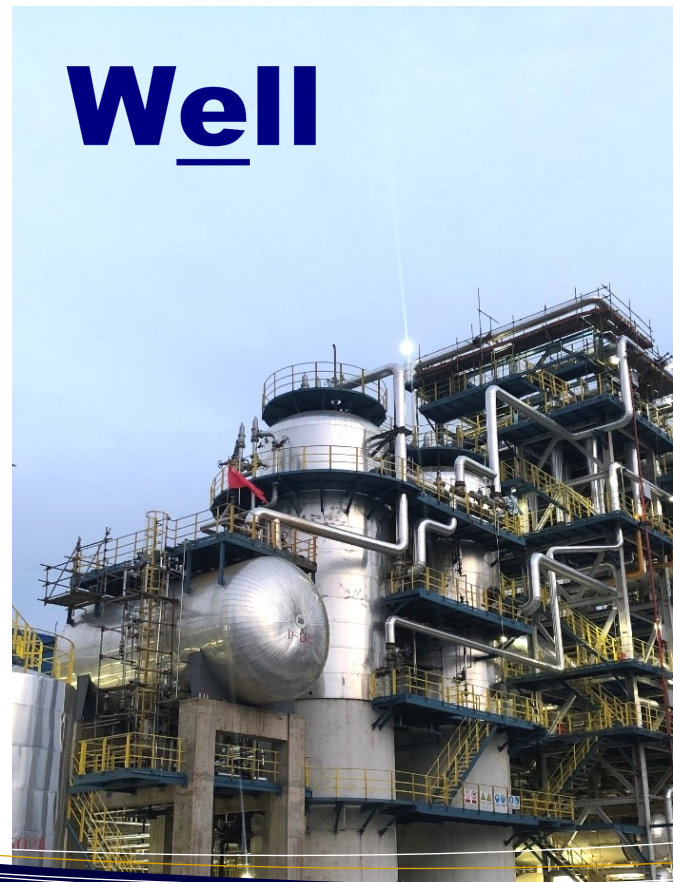




Ionikylation

Composite Ionic Liquid Alkylation

A Commercially Proven, Non-Hazardous, Non-Corrosive, and Environmentally Friendly Composite Ionic Liquid (CIL) Alkylation Technology



COMPETITIVE ADVANTAGE

Ionikylation is Well's composite ionic liquid alkylation process that produces high octane gasoline constituents from refinery streams. Ionikylation offers the following advantages over conventional alkylation technologies:

- Many commercial units
- Inherently safe process
- Non-corrosive system: low-cost carbon steel equipment
- Non-hazardous emissions and waste, reduced waste water
- Environmentally friendly
- High catalyst activity, stable reactor operating system
- High quality alkylate product (96-98 RON, chloride < 5ppm)
- Integrated catalyst regeneration
- Competitive energy consumption

Well Resources Inc.

www.wellresources.ca

Phone:

+1 (780) 999-9966
+86 13810334755

Mail:

Attn: Well Resources Inc.
PO Box 52027 RPO Edmonton Trail
Calgary, Alberta
T2E 8K9

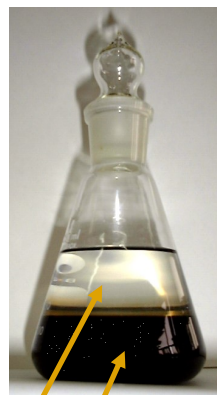
Email:

info@wellresources.ca

Well

CIL CATALYST

- Highly tunable
- Liquid salt (melting point less than 100°C)
- Non-corrosive
- Relatively high solubility and diffusivity for hydrocarbons
- Forms no emulsions with hydrocarbon and is dense (easy to separate reactants)



Alkylate (96-98 RON)

CIL Catalyst



INHERENTLY SAFE CATALYST

- No adverse reaction when contacted with skin
- Spill incident: wipe with dry cloth or paper and rinse
- Standard PPE: wear coveralls containing plastic liner, safety glasses

TECHNOLOGY COMPARISON

	HF	H ₂ SO ₄	Composite Ionic Liquid
Non-hazardous	✗	✓	✓
Non-corrosive	✗	✗	✓
High activity	✓	✗	✓
High selectivity	✓	✗	✓
Commercially proven	✓	✓	✓

Health, safety, and environmental factors should be paramount in driving investment decisions. In an era where environmental preservation and safety are top priorities, Ionikylation is the alkylation technology of choice.

EFFECTIVE RESOURCE UTILIZATION

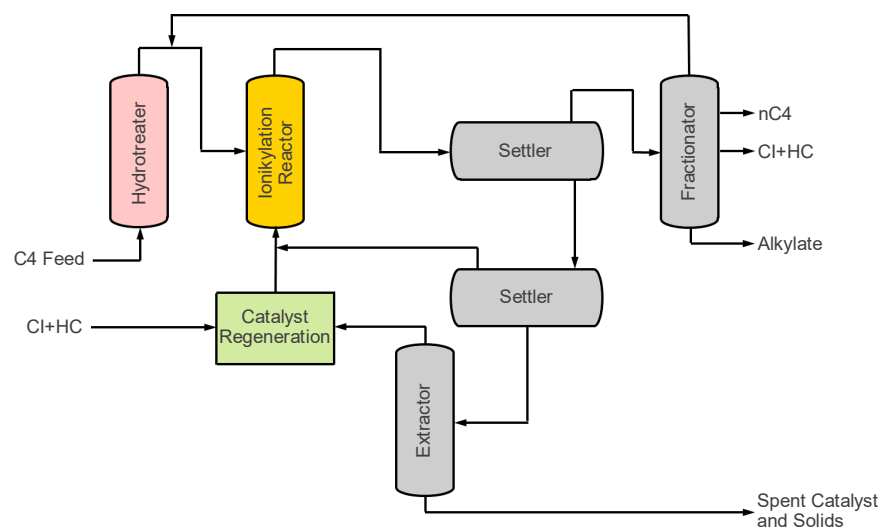


Well's philosophy is simple: a deep technical understanding of relevant issues is key to the development of meaningful solutions. Well's world-class expertise and partner facilities uniquely position it to be at the forefront of groundbreaking technology development and licensing. Learn more at www.wellresources.ca

IONI KYLATION PROJECTS

As of Q3 2019

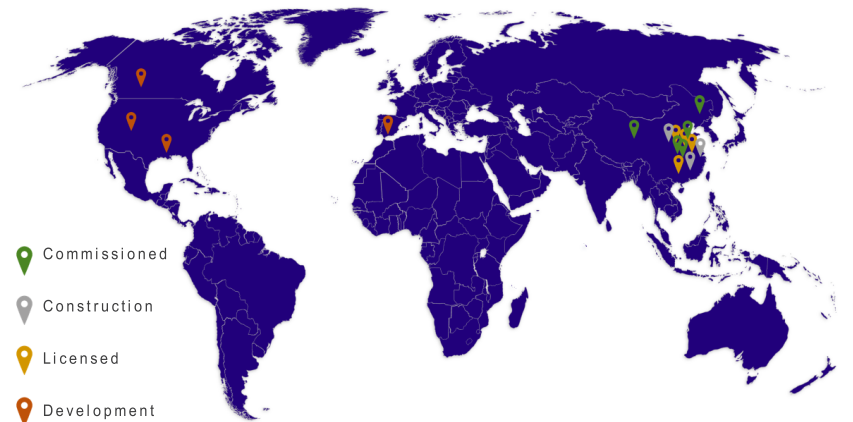
IONI KYLATION PROCESS



All Ionikylation process equipment is constructed of **carbon steel**.

SAFE EQUIPMENT

April 2016: Ionikylation unit passed the government safety inspection after 3 years of continuous operation; no corrosion in any equipment internals.



INTEGRITY. INNOVATION. IMPACT.

At Well, we are passionate about developing meaningful solutions to major issues in the oil and gas industry.

We develop and license cost effective and commercially proven technologies based on 30+ years of research and development.

Well

COMMERCIAL IONIKYLATION UNITS

Commercially operating and licensed Ionikylation facilities exist throughout Asia-Pacific. Major refiners (including PetroChina and Sinopec) will construct 10 new Ionikylation units between 2018-2020, ranging from 50,000 tpy to 300,000 tpy.



PetroChina Harbin Refinery
150,000 tpy



PetroChina Golmud Refinery
50,000 tpy



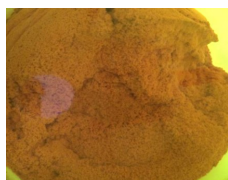
Sinopec Jiujiang Refinery
300,000 tpy



Sinopec Wuhan Refinery
300,000 tpy

SAFE BY-PRODUCTS

Ionikylation by-products are chemically benign and can be safely handled and disposed. No more spent acid treatment.



Benign Paste from Extractor



Solidify



Dry



LICENSING IONIKYLATION

To explore licensing opportunities, contact us at info@wellresources.ca