

Carbon Dioxide Capture and Storage: Issues and Prospects

Annual Review of Environment and Resources

39, 243-270

DOI: [10.1146/annurev-environ-032112-095222](https://doi.org/10.1146/annurev-environ-032112-095222)

Citation Report

#	ARTICLE	IF	CITATIONS
1	Climate constraints on the carbon intensity of economic growth. Environmental Research Letters, 2015, 10, 095006.	5.2	36
2	Carbon Capture and Storage: A Controversial Climate Mitigation Approach. International Spectator, 2015, 50, 74-84.	1.5	14
3	Laboratory core flooding experimental systems for CO ₂ geosequestration: An updated review over the past decade. Journal of Rock Mechanics and Geotechnical Engineering, 2016, 8, 113-126.	8.1	53
4	Separating the debate on CO ₂ utilisation from carbon capture and storage. Environmental Science and Policy, 2016, 60, 38-43.	4.9	152
5	The 'best available science' to inform 1.5 °C policy choices. Nature Climate Change, 2016, 6, 646-649.	18.8	88
6	Offshore CCS and ocean acidification: a global long-term probabilistic cost-benefit analysis of climate change mitigation. Climatic Change, 2016, 137, 157-170.	3.6	15
7	Measuring the duration of formative phases for energy technologies. Environmental Innovation and Societal Transitions, 2016, 21, 95-112.	5.5	82
8	Economics of carbon dioxide capture and utilization—a supply and demand perspective. Environmental Science and Pollution Research, 2016, 23, 22226-22241.	5.3	177
9	Planning and scheduling of CO ₂ capture, utilization and storage (CCUS) operations as a strip packing problem. Chemical Engineering Research and Design, 2016, 104, 358-372.	5.6	44
10	The Role of Material Efficiency in Environmental Stewardship. Annual Review of Environment and Resources, 2016, 41, 575-598.	13.4	71
11	Rapid scale-up of negative emissions technologies: social barriers and social implications. Climatic Change, 2016, 139, 155-167.	3.6	103
12	Toxicological risk assessment in CO ₂ capture and storage technology. International Journal of Greenhouse Gas Control, 2016, 55, 118-143.	4.6	24
13	An investigation of carbon dioxide capture by chitin acetate/DMSO binary system. Carbohydrate Polymers, 2016, 152, 163-169.	10.2	36
14	An optimization framework for the integrated planning of generation and transmission expansion in interconnected power systems. Applied Energy, 2016, 170, 1-21.	10.1	96
15	Thermophysical Properties and Phase Behavior of Fluids for Application in Carbon Capture and Storage Processes. Annual Review of Chemical and Biomolecular Engineering, 2017, 8, 381-402.	6.8	16
16	Pore-scale Displacement Mechanisms Investigation in CO ₂ -brine-glass Beads System. Energy Procedia, 2017, 105, 4122-4127.	1.8	2
17	Selling stories of techno-optimism? The role of narratives on discursive construction of carbon capture and storage in the Japanese media. Energy Research and Social Science, 2017, 31, 50-59.	6.4	44
18	Future intraplate stress and the longevity of carbon storage. Fuel, 2017, 200, 31-36.	6.4	5

#	ARTICLE	IF	CITATIONS
19	The global carbon nation: Status of CO ₂ capture, storage and utilization. EPJ Web of Conferences, 2017, 148, 00002.	0.3	8
20	The Influence of Heterogeneity in Wettability and Pore Structure in CO ₂ Geological Sequestration: A Pore-scale Study. Energy Procedia, 2017, 114, 4975-4980.	1.8	0
21	Overview of carbon capture and storage. , 2017, , 23-36.		48
22	The Future of Low-Carbon Electricity. Annual Review of Environment and Resources, 2017, 42, 289-316.	13.4	25
23	Pore-scale investigation of effects of heterogeneity on CO ₂ geological storage using stratified sand packs. , 2017, 7, 972-987.		14
24	Three-dimensional graphene-based macrostructures for sustainable energy applications and climate change mitigation. Progress in Materials Science, 2017, 90, 224-275.	32.8	60
25	Competitive Adsorption/Desorption of CH ₄ /CO ₂ /N ₂ Mixture on Anthracite from China for ECBM Operation. Energy Procedia, 2017, 105, 4289-4294.	1.8	14
26	Screening of carbon dioxide utilization options using hybrid Analytic Hierarchy Process-Data Envelopment Analysis method. Journal of Cleaner Production, 2017, 165, 1361-1370.	9.3	30
27	Quasi-Two-Dimensional Phase Transition of Methane Adsorbed in Cylindrical Silica Mesopores. Langmuir, 2017, 33, 14252-14262.	3.5	8
28	Risk, Liability, and Economic Issues with Long-Term CO ₂ Storage—A Review. Natural Resources Research, 2017, 26, 89-112.	4.7	39
29	Perspective—Low-Carbon Electricity Is Great: What about “Less-Carbon”? Journal of the Electrochemical Society, 2017, 164, F1587-F1590.	2.9	12
30	Editorial: Geomicrobes: Life in Terrestrial Deep Subsurface. Frontiers in Microbiology, 2017, 8, 103.	3.5	11
31	Alternative pathways to the 1.5°C target reduce the need for negative emission technologies. Nature Climate Change, 2018, 8, 391-397.	18.8	455
32	Geospatial analysis of near-term potential for carbon-negative bioenergy in the United States. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, 3290-3295.	7.1	82
33	A review of optimization and decision-making models for the planning of CO ₂ capture, utilization and storage (CCUS) systems. Sustainable Production and Consumption, 2018, 13, 1-15.	11.0	222
34	Non-constant Diffusion Behavior for CO ₂ Diffusion into Brine: Influence of Density-Driven Convection. Journal of Solution Chemistry, 2018, 47, 1926-1941.	1.2	7
35	Tailoring the Discharge Reaction in Li-CO ₂ Batteries through Incorporation of CO ₂ Capture Chemistry. Joule, 2018, 2, 2649-2666.	24.0	98
36	Scrutinising the Gap between the Expected and Actual Deployment of Carbon Capture and Storage—A Bibliometric Analysis. Energies, 2018, 11, 2319.	3.1	26

#	ARTICLE	IF	CITATIONS
37	Net-zero emissions energy systems. Science, 2018, 360, .	12.6	1,165
38	Negative emissionsâ€™Part 2: Costs, potentials and side effects. Environmental Research Letters, 2018, 13, 063002.	5.2	823
39	CO2 Recycling to Dimethyl Ether: State-of-the-Art and Perspectives. Molecules, 2018, 23, 31.	3.8	133
40	The carbon credentials of hydrogen gas networks and supply chains. Renewable and Sustainable Energy Reviews, 2018, 91, 1077-1088.	16.4	46
41	How can carbon capture utilization and storage be incentivized in China? A perspective based on the 45Q tax credit provisions. Energy Policy, 2019, 132, 1229-1240.	8.8	50
42	Recent developments and challenges ahead in carbon capture and sequestration technologies. SN Applied Sciences, 2019, 1, 1.	2.9	57
43	Pathways Toward Sustainable Development. , 2019, , 510-543.		0
44	Carbon capture and utilization in the steel industry: challenges and opportunities for chemical engineering. Current Opinion in Chemical Engineering, 2019, 26, 81-87.	7.8	67
45	Spectroscopic study of CO2 and CO2â€™N2 mixture plasma using dielectric barrier discharge. AIP Advances, 2019, 9, .	1.3	25
46	Time Behavior of Anomalous Solute Transport in Threeâ€™Dimensional Cemented Porous Media. Soil Science Society of America Journal, 2019, 83, 1012-1023.	2.2	5
47	Cost analysis of carbon capture and storage for current gasâ€™fired power plants in Nigeria. , 2019, 9, 370-386.		4
48	The contradiction of the sustainable development goals: Growth versus ecology on a finite planet. Sustainable Development, 2019, 27, 873-884.	12.5	255
49	An Overview of the Status and Challenges of CO2 Storage in Minerals and Geological Formations. Frontiers in Climate, 2019, 1, .	2.8	200
50	Governance of bioenergy with carbon capture and storage (BECCS): accounting, rewarding, and the Paris agreement. Climate Policy, 2019, 19, 329-341.	5.1	50
51	Placing hubs in CO2 pipelines: An application to industrial CO2 emissions in the Iberian Peninsula. Applied Energy, 2019, 236, 22-31.	10.1	12
52	Multiscale modeling of the effective elastic properties of fluid-filled porous materials. International Journal of Solids and Structures, 2019, 162, 36-44.	2.7	7
53	Is Green Growth Possible?. New Political Economy, 2020, 25, 469-486.	4.4	712
54	A theoretical study of gas adsorption on calcite for CO2 enhanced natural gas recovery. Applied Surface Science, 2020, 504, 144575.	6.1	28

#	ARTICLE	IF	CITATIONS
55	Biomass “ Flare gas synergistic co-processing in the presence of carbon dioxide for the controlled production of syngas (H ₂ :CO=2.5). Chemical Engineering Journal, 2020, 385, 123783.	12.7	10
56	Transitioning from coal: Toward a renewables-based socio-technical regime in Saskatchewan. Environmental Innovation and Societal Transitions, 2020, 36, 321-330.	5.5	12
57	Total cost of carbon capture and storage implemented at a regional scale: northeastern and midwestern United States. Interface Focus, 2020, 10, 20190065.	3.0	61
58	Recent Progress with Pincer Transition Metal Catalysts for Sustainability. Catalysts, 2020, 10, 773.	3.5	71
59	Global Energy System Transformations to 1.5°C: The Impact of Revised Intergovernmental Panel on Climate Change Carbon Budgets. Energy Technology, 2020, 8, 2000395.	3.8	18
60	New Porous Silicon-Containing Organic Polymers: Synthesis and Carbon Dioxide Uptake. Processes, 2020, 8, 1488.	2.8	9
61	Carbon Dioxide Sequestration via Gas Hydrates: A Potential Pathway toward Decarbonization. Energy & Fuels, 2020, 34, 10529-10546.	5.1	168
62	Energy-consumption analysis of carbon-based material for CO ₂ capture process. Fluid Phase Equilibria, 2020, 510, 112504.	2.5	3
63	Effects of Temperature on Amine-Mediated CO ₂ Capture and Conversion in Li Cells. Journal of Physical Chemistry C, 2020, 124, 18877-18885.	3.1	4
64	Identifying geologic characteristics and operational decisions to meet global carbon sequestration goals. Energy and Environmental Science, 2020, 13, 5000-5016.	30.8	20
65	From CO ₂ activation to catalytic reduction: a metal-free approach. Chemical Science, 2020, 11, 10571-10593.	7.4	73
66	Ab Initio Molecular Dynamics Investigation of CH ₄ /CO ₂ Adsorption on Calcite: Improving the Enhanced Gas Recovery Process. ACS Omega, 2020, 5, 30226-30236.	3.5	6
67	Geologic CO ₂ storage in arkosic sandstones with CaCl ₂ -rich formation water. Chemical Geology, 2020, 558, 119867.	3.3	13
68	Conventional systems for exhaust gas cleaning and carbon capture and sequestration. , 2020, , 65-96.		4
69	Influence of CO ₂ on Water Chemistry and Bacterial Community Structure and Diversity: An Experimental Study in the Laboratory. Aquatic Geochemistry, 2020, 26, 401-419.	1.3	0
70	Framing in Renewable Energy Policies: A Glossary. Energies, 2020, 13, 2871.	3.1	19
71	Carbon recycling “ An immense resource and key to a smart climate engineering: A survey of technologies, cost and impurity impact. Renewable and Sustainable Energy Reviews, 2020, 131, 110010.	16.4	29
72	Perspectives on oxygen-based coal conversion towards zero-carbon power generation. Energy, 2020, 196, 117074.	8.8	5

#	ARTICLE	IF	CITATIONS
73	Carbon Geoengineering and the Metabolic Rift: Solution or Social Reproduction?. Critical Sociology, 2020, 46, 1233-1249.	1.9	8
74	Saskatchewan's energy future: Risk and pathways analysis. Environmental Innovation and Societal Transitions, 2020, 34, 237-250.	5.5	9
75	A theoretical study of gas adsorption on α -quartz (001) for CO ₂ enhanced natural gas recovery. Applied Surface Science, 2020, 525, 146472.	6.1	10
76	High-throughput screening of metal-organic frameworks for CO ₂ and CH ₄ separation in the presence of water. Chemical Engineering Journal, 2021, 403, 126392.	12.7	53
77	CO ₂ hydrogenation into formate and methyl formate using Ru molecular catalysts supported on NNN pincer porous organic polymers. Inorganic Chemistry Frontiers, 2021, 8, 1727-1735.	6.0	13
78	Risk and socio-technical electricity pathways: A systematic review of 20 years of literature. Energy Research and Social Science, 2021, 71, 101841.	6.4	4
79	Dimethyl ether as circular hydrogen carrier: Catalytic aspects of hydrogenation/dehydrogenation steps. Journal of Energy Chemistry, 2021, 58, 55-77.	12.9	67
80	A state-of-the-art review on waterless gas shale fracturing technologies. Journal of Petroleum Science and Engineering, 2021, 196, 108048.	4.2	53
81	Amine-based capture of CO ₂ for utilization and storage. Polymer Journal, 2021, 53, 93-102.	2.7	93
82	Geochemical controls on CO ₂ interactions with deep subsurface shales: implications for geologic carbon sequestration. Environmental Sciences: Processes and Impacts, 2021, 23, 1278-1300.	3.5	16
83	Interfacial and Confinement-Mediated Organization of Gas Hydrates, Water, Organic Fluids, and Nanoparticles for the Utilization of Subsurface Energy and Geological Resources. Energy & Fuels, 2021, 35, 4687-4710.	5.1	13
84	Understanding contrasting narratives on carbon dioxide capture and storage for Dutch industry using system dynamics. International Journal of Greenhouse Gas Control, 2021, 105, 103235.	4.6	17
85	Assessing the Role of Carbon Capture and Storage in Mitigation Pathways of Developing Economies. Energies, 2021, 14, 1879.	3.1	9
86	Active hydraulic barrier for retarding CO ₂ migration towards fault during CO ₂ storage in tilted reservoir. Environmental Earth Sciences, 2021, 80, 1.	2.7	1
87	Advances in the Use of Nanocomposite Membranes for Carbon Capture Operations. International Journal of Chemical Engineering, 2021, 2021, 1-22.	2.4	5
88	Urgent need for post-growth climate mitigation scenarios. Nature Energy, 2021, 6, 766-768.	39.5	97
89	Performance-Based Screening of Porous Materials for Carbon Capture. Chemical Reviews, 2021, 121, 10666-10741.	47.7	115
90	Bright spots of carbon storage in temperate forests. Journal of Applied Ecology, 2021, 58, 3012-3022.	4.0	3

#	ARTICLE	IF	CITATIONS
91	Salt precipitation during geological sequestration of supercritical CO ₂ in saline aquifers: A pore-scale experimental investigation. <i>Advances in Water Resources</i> , 2021, 155, 104011.	3.8	15
92	Ab-Initio Molecular Dynamics investigation of gas adsorption on α -quartz (001) for CO ₂ enhanced natural gas recovery. <i>Journal of Petroleum Science and Engineering</i> , 2021, 205, 108963.	4.2	2
93	A comprehensive review of biomass based thermochemical conversion technologies integrated with CO ₂ capture and utilisation within BECCS networks. <i>Resources, Conservation and Recycling</i> , 2021, 173, 105734.	10.8	109
94	The contradiction of the sustainable development goals: Growth versus ecology on a finite planet. <i>Sustainable Development</i> , 2019, 27, 873-884.	12.5	16
95	Strategic Design and Tactical Planning for Energy Supply Chain Systems. , 2017, , 47-74.		2
96	Carbon Capture and Storage in Geologic Formations. , 2017, , 497-545.		3
97	Advances and Slowdowns in Carbon Capture and Storage Technology Development. <i>SSRN Electronic Journal</i> , 0, , .	0.4	2
98	Techno-Economic Assessment Guidelines for CO ₂ Utilization. <i>Frontiers in Energy Research</i> , 2020, 8, .	2.3	121
99	Uncertain storage prospects create a conundrum for carbon capture and storage ambitions. <i>Nature Climate Change</i> , 2021, 11, 925-936.	18.8	69
100	Carbon Capture, Utilisation and Storage. , 2020, , 53-67.		0
101	Assessing the feasibility of archetypal transition pathways towards carbon neutrality – A comparative analysis of European industries. <i>Resources, Conservation and Recycling</i> , 2022, 177, 106015.	10.8	18
102	Effective contamination control strategies facilitating axenic cultivation of <i>Haematococcus pluvialis</i> : Risks and challenges. <i>Bioresource Technology</i> , 2022, 344, 126289.	9.6	18
103	Multi-Agent Cooperation Based Reduced-Dimension Q(Î») Learning for Optimal Carbon-Energy Combined-Flow. <i>Energies</i> , 2020, 13, 4778.	3.1	1
104	A review of technologies for carbon capture, sequestration, and utilization: Cost, capacity, and technology readiness. , 2022, 12, 200-230.		44
105	Carbon Dioxide Emissions, Capture, Storage and Utilization: Review of Materials, Processes and Technologies. <i>Progress in Energy and Combustion Science</i> , 2022, 89, 100965.	31.2	200
106	Le potentiel du stockage géologique du CO ₂ par minéralisation. <i>Annales Des Mines - Responsabilité Et Environnement</i> , 2022, N° 105, 57-62.	0.1	0
107	Ecological macroeconomic assessment of meeting a carbon budget without negative emissions. <i>Global Sustainability</i> , 2022, 5, .	3.3	3
108	Coping with climate chang. , 2022, , 143-233.		2

#	ARTICLE	IF	CITATIONS
109	Technical Perspective of Carbon Capture, Utilization, and Storage. Engineering, 2022, 14, 27-32.	6.7	47
110	Molecular dynamics of CH_4 / CO_2 on calcite for enhancing gas recovery. Canadian Journal of Chemical Engineering, 2022, 100, 3184-3195.	1.7	2
111	Geomechanics for energy and the environment: Current developments. Geomechanics for Energy and the Environment, 2022, 32, 100345.	2.5	1
112	Comparison for Torrefaction Properties and Combustion Behaviors of Several Biomass Materials. , 2021, 30, 46-53.		0
114	Scenarios for mitigating CO_2 emissions from energy supply in the absence of CO_2 removal. Climate Policy, 2022, 22, 882-896.	5.1	9
115	Global Environmental Problems: A Nexus Between Climate, Human Health and COVID 19 and Evolving Mitigation Strategies. , 2022, , 65-110.		0
116	Several key issues for CCUS development in China targeting carbon neutrality. , 2022, 1, .		14
118	CO_2 enhanced gas recovery and sequestration as CO_2 hydrate in shallow gas fields in Alberta, Canada. Journal of Natural Gas Science and Engineering, 2022, 103, 104654.	4.4	5
119	Sociotechnical Considerations About Ocean Carbon Dioxide Removal. Annual Review of Marine Science, 2023, 15, 41-66.	11.6	16
120	Scenarios for the rapid phase-out of fossil fuels in Australia in the absence of CO_2 removal. Australasian Journal of Environmental Management, 2022, 29, 275-283.	1.1	1
121	Funding of the Energy Transition by Monetary Sovereign Countries. Energies, 2022, 15, 5908.	3.1	0
122	Exploring the Theoretical Link between Profitability and Luxury Emissions. SSRN Electronic Journal, 0, , .	0.4	1
123	CO_2 in indoor environments: From environmental and health risk to potential renewable carbon source. Science of the Total Environment, 2023, 856, 159088.	8.0	28
124	Process Intensification of CO_2 Desorption. Industrial & Engineering Chemistry Research, 0, , .	3.7	3
125	Environmental and safety issues associated with geological carbon storage: a review. Euro-Mediterranean Journal for Environmental Integration, 2022, 7, 445-461.	1.3	2
126	Investigation of supercritical CO_2 mass transfer in porous media using X-ray micro-computed tomography. Advances in Water Resources, 2023, 171, 104338.	3.8	6
127	Geologic carbon storage: key components. , 2023, , 325-422.		1
128	Accelerate the offshore CCUS to carbon-neutral China. Fundamental Research, 2022, , .	3.3	5

#	ARTICLE	IF	CITATIONS
129	Carbon capture and storage in Saskatchewan: An analysis of communicative practices in a contested technology. Renewable and Sustainable Energy Reviews, 2023, 173, 113104.	16.4	1
130	Energy Sector Derived Combustion Products Utilization“Current Advances in Carbon Dioxide Mineralization. Energies, 2022, 15, 9033.	3.1	2
131	CO ₂ -negative fuel production using low-CO ₂ electricity: Syngas from a combination of methane pyrolysis and dry reforming with techno-economic analysis. Energy Conversion and Management, 2023, 277, 116624.	9.2	14
132	Subsurface carbon dioxide and hydrogen storage for a sustainable energy future. Nature Reviews Earth & Environment, 2023, 4, 102-118.	29.7	69
133	Oil and Natural Gas and Sustainability. , 2023, , 47-66.		0
134	Optimization and Process Effect for Microalgae Carbon Dioxide Fixation Technology Applications Based on Carbon Capture: A Comprehensive Review. Journal of Carbon Research, 2023, 9, 35.	2.7	11
135	Potential Pathway for Reliable Long-Term CO ₂ Storage as Clathrate Hydrates in Marine Environments. Energies, 2023, 16, 2856.	3.1	2
136	Dissociation of CO ₂ in non-thermal atmospheric pressure planer dielectric barrier discharge. International Journal of Modern Physics B, 2024, 38, .	2.0	0
138	Machine learning framework for estimating CO ₂ adsorption on coalbed for carbon capture, utilization, and storage applications. International Journal of Coal Geology, 2023, 275, 104297.	5.0	5
139	Environmentally Sustainable Large-Scale CO ₂ Sequestration through Hydrates in Offshore Basins: Ab Initio Comprehensive Analysis of Subsea Parameters and Economic Perspective. Energy & Fuels, 2023, 37, 8739-8764.	5.1	11
140	Research progress of carbon capture and storage (CCS) technology based on the shipping industry. Ocean Engineering, 2023, 281, 114929.	4.3	9
141	Design of a packed bed chemical looping (unmixed) combustion reactor for the application of heating liquid: A theoretical study. , 2023, 13, 593-610.		1
142	Deployment of hydrogen in hard-to-abate transport sectors under limited carbon dioxide removal (CDR): Implications on global energy-land-water system. Renewable and Sustainable Energy Reviews, 2023, 184, 113578.	16.4	9
143	Safety and Leakage of CO ₂ Storages. , 2023, , .		0
144	Influence of orientational disorder in the adsorbent on the structure and dynamics of the adsorbate: MD simulations of SO ₂ in ZSM-22. Chemical Engineering Science, 2024, 283, 119389.	3.8	0
145	Autonomous screening of complex phase spaces using Bayesian optimization for SAXS measurements. Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 2023, 1057, 168719.	1.6	0
146	Consecutive sol-gel synthesis of Cu-Zn/Al ₂ O ₃ catalyst for CO ₂ Hydrogenation. AIP Conference Proceedings, 2023, , .	0.4	0
147	Carbon dioxide activation by discandium dioxide cations in the gas phase: a combined investigation of infrared photodissociation spectroscopy and DFT calculations. Physical Chemistry Chemical Physics, 0, , .	2.8	0

#	ARTICLE	IF	CITATIONS
148	Recent progress of geopolymers for carbon dioxide capture, storage and conversion. Journal of CO2 Utilization, 2023, 78, 102631.	6.8	2
149	Molecular Dynamics Study on the Diffusion Mass Transfer Behaviour of CO2 and Crude Oil in Fluids Produced via CO2 Flooding. Molecules, 2023, 28, 7948.	3.8	0
151	Alterations in petrophysical and mechanical properties due to basaltic rock-CO2 interactions: comprehensive review. Arabian Journal of Geosciences, 2024, 17, .	1.3	0
152	Giga-ton and tera-watt scale challenges at the energy - climate crossroads: A global perspective. Energy, 2024, 290, 129971.	8.8	0
153	Expert elicitation of the timing and uncertainty to establish a geologic sequestration well for CO ₂ in the United States. Proceedings of the National Academy of Sciences of the United States of America, 2024, 121, .	7.1	0
154	Decarbonization in Australia and India: Bilateral Opportunities and Challenges for the Net Zero Transformation. ACS Engineering Au, 0, , .	5.1	1
156	Antioxidant-driven activity and stability enhancement in multiphase bicarbonate hydrogenation catalysis with a Ru-PNP pincer complex. Journal of CO2 Utilization, 2024, 81, 102718.	6.8	0
157	A hybrid numerical model for coupled hydro-mechanical analysis during CO2 injection into heterogeneous unconventional reservoirs. , 2024, 124, 205244.		0