



Daily current affairs

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OVL rejects Venezuela's offer for oilfield stake

- ONGC Videsh Ltd. (OVL) has rejected Venezuela's offer for additional stake in an oilfield as it fears the Latin American nation may use it as an excuse to not pay \$449 million of dues, a top official said.
- State oil firm Petroleos de Venezuela SA had last year offered a 9% stake in the San Cristobal field to OVL.
- OVL already holds a 40% stake in the field, which produces about 18,000 barrels of oil per day.

Additional Info:

- ONGC Videsh, a Miniratna Schedule "A" Central Public Sector Enterprise (CPSE) of the Government of India under the administrative control of the Ministry of Petroleum & Natural Gas is the wholly owned subsidiary and overseas arm of Oil and Natural Gas Corporation Limited (ONGC), the flagship national oil company (NOC) of India.
- The primary business of ONGC Videsh is to prospect for oil and gas acreages outside India, including exploration, development and production of oil and gas.
- ONGC Videsh owns Participating Interests in 41 oil and gas assets in 20 countries and produced about 26.2% of oil and 20.7% of oil and natural gas of India's domestic production in FY'18.
- In terms of reserves and production, ONGC Videsh is the second largest petroleum company of India, next only to its parent ONGC.

ONGC Videsh has stake in 41 oil and gas projects in 20 Countries, viz. Azerbaijan (2 projects), Bangladesh (2 Projects), Brazil (2 projects), Colombia (7 projects), Iran (1 project), Iraq (1 project), Israel (1 project), Kazakhstan (1 project), Libya (1 project), Mozambique (1 Project), Myanmar (6 projects), Namibia (1 project), New Zealand (1 Project), Russia (3 projects), South Sudan (2 projects), Sudan (2 projects), Syria (2 projects), UAE (1 project), Venezuela (2 projects), and Vietnam (2 projects).

Cyborg cockroach could aid rescue missions

- Scientists have developed a cyborg cockroach powered by a tiny neuro-controller that could be used in search and rescue missions to find people trapped under collapsed buildings.
- The neuro-controller is part of a tiny electronic 'backpack' that can be attached to the

insect with its wires connected to the insect's antennae lobes.

Predatory bacteria may fight antibiotic resistance

- In a bid to fight back against antibiotic-resistant bacteria, researchers are now developing germ-eating microbes that will attack all sorts of nasties, including bacterial lung infections, plague and deadly germs that have developed resistance to antibiotics.
 - They studied *Bdellovibrio*, which bores into bigger bacteria and eats them from the inside out.
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Ocean Cleanup team heads to the Pacific

- It hopes to clear half of the infamous 'garbage patch' in next five years, once all systems are deployed
- A supply ship towing a long floating boom designed to corral ocean plastic has set sail from for a test run ahead of a trip to the Great Pacific Garbage Patch.
- The ambitious project by **The Ocean Cleanup, a Dutch non-profit group**, hopes to clean up half of the infamous garbage patch within five years once all systems are deployed.
- Under a cloudless sky the Maersk Launcher ship sailed on Saturday past the Golden Gate Bridge out into the Pacific sea accompanied by a flotilla of sailboats and kayaks.
- The supply vessel was towing a 600 meter-long boom device dubbed System 001, designed to contain floating ocean plastic so it can be scooped up and recycled.
- The system includes a tapered three-meter skirt to catch plastic floating just below the surface.
- The ship was heading to a spot 240 nautical miles off the California coastline for a two-week trial before sailing to the Great Pacific Garbage Patch, a floating trash pile twice the size of France that swirls in the ocean halfway between California and Hawaii.

Plastic waste

- The Research team believe the Pacific garbage patch contains some 80,000 metric tones of plastic waste.
 - Plastic has started to accumulate in the ocean since... the 1950s.
 - He said that scientists first learned about the plastic concentrating in the Pacific garbage patch in the 1970s.
 - Land-based plastic comes mainly from rivers, But we also find a lot of fishing ropes, fishing nets.
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IISER Bhopal develops organic solar cell using vitamin B12 derivative-The synthesised material absorbs light much like porphyrin in natural chlorophyll

- Researchers at the Indian Institute of Science Education and Research (IISER) Bhopal have developed cheaper and more flexible organic solar cells using a synthetic derivative

of vitamin B12.

- An organic solar cell is made up of acceptor and donor materials.

Acceptor

- Commercially available organic molecule was used as an acceptor.
- The organic cells developed by the team showed three absorption bands between 400-650 nm — whole visible range of the solar spectrum — with a maximum absorption at 420 nm.
- The ability to turn the light absorbed to electricity (power conversion efficiency) was 2.5%.

Donor

- The donor absorbs light from solar radiation and the harvested energy is passed to the electrodes with the help of the acceptor.
- In the present study, published in ACS Applied Materials and Interfaces, the researchers synthesised the donor using an artificial aromatic chemical (corrole) which has a similar structure to the corrin ring in vitamin B12.
- The artificially synthesised corrole (Cor-BODIPY) can also be used in flexible electronics absorbs light much like porphyrin in natural chlorophyll unlike the silicon solar cells.

Enhanced performance

- The researchers enhanced the performance of the solar cells by coating them with different solvents.
- The surface morphology was investigated after the treatment and microscopy images showed that the treatment helped improve the alignment of the Cor-BODIPY donor by forming a denser molecular packing on the active surface.
- This treatment more than doubled the power conversion efficiency from 2.5% to 6.6%.
- Many solar cells made of porphyrins which started with 1% efficiency have now reached over 10% due to appropriate improvements.

New Perspectives

- Further optimisation can help increase the efficiency of our cells too. More studies are also being carried out to ascertain its stability and the results look promising.
- Corroles are currently used as sensors, catalysts and in biomedical imaging.
- This is the first study wherein a corrole has been utilised for a bulk heterojunction solar cell as a donor material.
- The authors hope that this study shall open up a new window and may pave way for its development as a low-cost, efficient photovoltaic material with a wide range of absorption and increased flexibility.