

## In this issue

### Diwali in Kanpur

The placid serenity of the Ganges and the city of Kanpur are losing to the pollution caused by urbanization and industrialization over the past several decades. Increasing content in the air aerosol appears hazardous to the lungs. Ramesh P. Singh *et al.* (page 1302) report size distribution of aerosol particles during the Diwali festival in Kanpur.

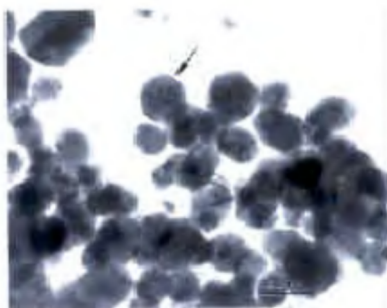
### Resistance to *Bt*-toxin

Cotton bollworm, *Helicoverpa armigera*, is a damaging pest for several genera of commercially important plants that include cotton, tomato, and vegetable crops. The estimated loss attributed to the damage caused by the pest totals around \$500 million annually. *Bt* transgenics have become a real solution to the menace caused by the pest after the Department of Biotechnology (Government of India) cleared the commercial cultivation of *Bt* transgenic cotton. Introduction of *Bt* transgenics is an important step in the integrated pest management through an eco-friendly biological control mechanism. Much of the reliability of the system will depend on the susceptibility of various strains over wide geographical location to the action of *Bt* toxin. Fakrudin *et al.* (page 1304) report a systematic study on the toxicity of the insecticidal *Bt* toxin on the larvae of *H. armigera* in a laboratory bioassay system using a full-length recombinant protein, expressed and purified from *E. coli*. The laboratory cultures of the insect, are established by growing several strains of the pest collected from the major cotton-growing regions in the south Indian cotton ecosystem. The results provide indirect measures on the techno-economic feasibility of large-

scale cultivation of *Bt*-transgenic crops, since direct spraying of *Bt*-toxins on native crops in the wild has never been attempted in India.

### SERS for gold nanoparticles

On page 1342, Pal *et al.* report the use of surface enhanced Raman Scattering (SERS) of several organic compounds with gold nanoparticles as the substrate. Surface enhanced Raman Scattering has been convenient in several studies, since significant enhancement of the signal is obtained from molecules that are adsorbed on solid metal surface or in the sol. A. Pal *et al.* prepare gold nanoparticles in aqueous medium by photo-irradiation of HAuCl<sub>4</sub>. The gold sol contains particles that are nanometer-sized and non-spherical. The gold nanoparticles are characterized with TEM, and appear quite stable. The gold particles are used to test for the SERS activity in dyes like cresyl fast violet, Rhodamine 6G and Brilliant cresyl blue. Several other model compounds with the nanoparticle substrates are also tested for SERS.



### Anionic micelles

Kumar *et al.* (page 1346) report the micellar growth of SDS in presence of

KBr and quaternary ammonium bromides studied with small angle neutron scattering measurements carried out at BARC, Trombay (India). They find no direct relation between the length of the alkyl moiety and aggregation number. They postulate that the surface charge and hydrophobic interactions are important in micellar growth.

### Himalayan geology

The tectonic status of the Jakhri Thrust Zone (JTZ), located in the Satluj valley of NW-Himalaya, is the subject of a debate. The peak temperature in the immediate vicinity of the Thrust is estimated to be ~600°C. Pandey and Virdi (page 1355) have studied the microstructure and fluid inclusion trail pattern in the JTZ to trace the evolutionary history of the zone. The thrust zone (JTZ) lies in the seismically vulnerable Lesser Himalayan Zone. The recrystallized quartzite microstructures and fluid inclusion trails show comparable patterns. They appear to be formed during the same deformation event. The fluid elements inside microcracks, in the form of fluid inclusion lane, serve as paleostress indicators. The size of fluid inclusions range over 5–20 µm; and are tabular, and predominantly biphasic (liquid–vapour). They are described as Type 1, Type 2 and Type 3, on the basis of the differences in the microstructure in the JTZ. The isochors of inclusions, assuming a lithostatic condition, indicate an isothermal exhumation path. The methodology demonstrates the utility of following fluid inclusion trail patterns as tectonic markers for exhumation history.

S. Ganguli