of platinum drugs with S-donor ligands are important for two reasons: [a] a mechanism of resistance to the platinum drugs is inactivation resulting from the reaction with S-containing biomolecules such as glutatione and methionine, and [b] thiol reagents can potentially act as "rescue agents" to prevent some of the toxicity of cisplatin.

The chapters in Part 5 illustrate how the discovery of the pharmacological properties of cisplatin have influenced the direction of co-ordination chemistry. Lippert takes a personal look at the "platinum blues", particularly those formed by the interaction of cisplatin and pyrimidine nucleobases. This theme is developed in the following chapters, written by L. Randaccio and E. Zangrando; G. Natile, F. P. Intini and C. Pacifico; and K. Matsumoto.

New Developments

The book ends with a description of new developments. The first two chapters of Part 6 focus on compounds in clinical trials. N. Farrell, Y. Qu, U. Bierbach, M. Valsecchi and E. Menta review the structure-activity relationships of di- and trinuclear platinum compounds undergoing Phase I clinical trials. L. R. Kelland reviews the development of orally active platinum drugs including JM216 and AMD473. The development of AMD473 takes up the theme of thiol reactivity as this compound was designed to have reduced reactivity with thiols, thereby overcoming this mechanism of resistance. K. E. Sandman and S. J. Lippard address the problem of new drug discovery in the light of the recent advances and application of combinatorial chemistry in drug discovery. They evaluate novel screening methodologies for testing libraries of platinum compounds.

One of the striking aspects of this book is the way in which personalities come through the description of the science. This is at its best in the dedication at the end of the chapter by Eastman in which he acknowledges the work of the late J. J. Roberts who was responsible for much of the early fundamental research on the biochemical mechanism of cisplatin. The discovery of cisplatin has inspired many scientists from diverse backgrounds and this is demonstrated throughout the many excellent reviews. Bernhard Lippert is to be congratulated on producing a book consisting not only of numerous scientific articles of high quality describing current research, but also a book that conveys the essence of scientific research. This book is recommended to all those with an interest in platinum chemistry, bioinorganic chemistry, biochemistry, and the clinical development of platinum anticancer drugs, and is a good illustration of their significance.

SIMON P. FRICKER

Reference

1 B. Rosenberg, L. VanCamp, J. E. Trosko and V. H. Mansour, *Nature*, 1969, **222**, 385

Thin-Film Light-Emitting Ruthenium(II) Devices

Solid-state light-emitting devices, based on ruthenium(II) complexes and operating at low voltages, do not have the high brightness and efficiency of electrogenerated chemiluminescence cells, also based on Ru(II) complexes. This is due to a slow electrochemical "charging" mechanism, which redistributes the counterions to create redox states for charge transport and light emission, and delays the device response after an applied potential bias. If solid-state devices are to be used in flat-panel displays, clearly shorter "charging" times (to brightness) are required.

Now, a team from Massachusetts Institute of Technology has produced single-layer, spin-cast films of small-molecule $Ru(bpy)_3(PF_6)_2$ (1) complexes (bpy = 2,2′-bipyridine) with high-brightness at low voltage, and no need of "charging" or reactive cathode materials (E. S. Handy, A. J. Pal and M. F. Rubner, *J. Am. Chem. Soc.*, 1999, **121**, (14), 3525–3528).

Thin films (~ 1000 Å) of the Ru(II) complex were spin-cast onto an indium tin oxide (anode) patterned glass from pyridine solutions. An aluminium cathode completed the devices. All devices had luminance levels of 1000 cd m^{-2} at 5 V and 200 cd m^{-2} at 3 V and external quantum efficiencies of 1 per cent at low voltage. The emitted red light could be shifted to a more useful red with increased device stability on replacing ligands in (1) by esterified bpy ligands. Device response times can be shortened by using short, high-voltage pulses, and low voltage operation.