

The Particle Atlas Electronic Edition

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In his preface to the first edition of *The Particle Atlas*, Jim Lodge talks of the challenge he posed to Dr. Walter McCrone in the 1950s to come up with a taxonomy for particles to assist in the identification of particles under the microscope. Jim's interest and the support of the Midwest Air Pollution Prevention Association and, later, the US Public Health Service, gave birth to the first edition of *The Particle Atlas*. This first edition, published in 1967, was a single volume which combined guidance on particle separation and identification techniques with a collection of optical micrographs of reference particles. The demand for this reference work soon outpaced the supply. In the meantime, however, it had become obvious that reprinting was not the answer as increased application of the microscope, in all its implementations, to environmental pollution and industrial contamination had resulted in a need for a more comprehensive work. The task of assembling the considerable textual content of a revised Atlas was begun. At the same time, the monumental task of re-photographing the existing particle set and those added in the intervening years was underway. Electron microscopy was added to the light microscopy collection and the number of particles was increased to over 600. The Second Edition, published in 1972, encompassed four volumes and included extensive tables of particle properties. In 1980, a further two volumes were published, incorporating some four hundred additional particles and updated information on new developments in particle analysis.

It was the first edition of *The Particle Atlas* that introduced us to the concept of assigning a binary code to particle types based on such factors as color, transparency and shape. To many of us, this six digit binary code was an interesting concept, pointing the way to computerized storage and

retrieval of particle characteristics. At that time, however, few of us had access to a computer to store and retrieve this particle information. Little did we realize that some twenty-five years later, computer technology would be commonplace in our labs, and homes, with desk top units unbelievably more powerful than our wildest hopes in the '50s. The ability to store on a three and a half inch plastic disc all the combined expertise and information of the six volume *Particle Atlas* would have seemed unlikely to us. Nevertheless, this represents today's technology. *The Particle Atlas* has indeed been reproduced on a CD-ROM and can be instantly available at your finger tips right alongside your microscope. How successful, then, has been this conversion to CD-ROM and how readily may it be used?

Making full use of the versatility of the Windows environment, PAE², as *The Particle Atlas Electronic Edition* is known, is a real interactive reference volume. Handling of the text portion of the Atlas has been particularly well implemented with rapid access to all sections of the Atlas from its Table of Contents. Once in the desired section, there is immediate cross-referencing from within the text to the glossary through "hyperlinks" identified by green type. A simple click on a mouse button instantly brings up the glossary definition of the selected hyperlink. Tables and figures referenced in the text are similarly selected and, although somewhat slower to respond, pop up on the screen within a fraction of a second. A very useful feature is the ability to minimize these tables and figures so that they can be recalled, this time instantaneously, while a further portion of text is read. Thus while studying, for example, dispersion staining, the several figures referenced can all be maintained in minimized format and recalled as required in order to better understand the theory.

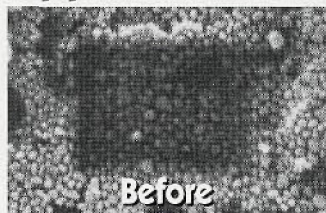
So much for the text portion, what of the micrographs which many regard as the strength of the original Atlas? Color rendering of the light micrographs for the most part accurately matches that of the original, although some users may see some color shifts due to palette limitations of the particular graphics adapter in their computer. The scanning electron micrographs, due to the loss of the original photographs, occasionally reflect the limitations of scanning a half-tone reproduction in place of an original but are of more than acceptable quality. The original SEM micrographs were taken over twenty years ago and thus represent the resolution typical of state of the art at that time. MicroDataware, producers of the PAE², are aware of the limitations in resolution of both the SEM micrographs and the EDXRA spectra and have indicated that updating this section is one of their priorities.

It is in its handling of accessing the micrographs, however, that PAE² excels. The search capabilities of the computer are well exploited. In addition to implementing the original McCrone binary code, PAE² permits the incorporation of refractive index and elemental data in the search codes to further narrow down the list of candidate particles. Wild card options enable partial binary codes to be entered if data is incomplete and the Atlas may also be searched by mineral or particle name, chemical composition, particle number from the original Atlas, and any combination of these parameters. Once narrowed, the list of particles identified can be browsed through at random. The full characteristics of each particle are presented, including fluorescence data added since the original Atlas. The optical or the electron micrograph can be selected and viewed for comparison with the unknown particle. Each micrograph is accompanied by its full description from the Atlas and the full flexibility of access to the glossary definitions remains intact through hyperlinks incorporated in the description. With a CD-ROM reader capable of a sustained transfer rate of 300 kB per second transfer rate, recall of the micrographs generally takes less than two seconds. *The search routines work smoothly and effectively and particle searches are carried out in a fraction of the time that it takes to access the same information in book form.*

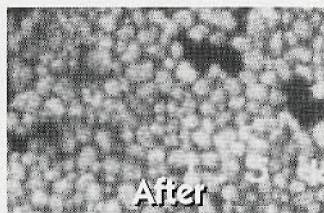
In all, this electronic edition of *The Particle Atlas* surpasses the original in its ease of use and brings to fruition the dream of the '50s. Certainly there are a few minor glitches but MicroDataware is aware of these and is rectifying them. They should not deter the serious particle microscopist. ■

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