

Afterword

It is natural that the electron microscope (EM) is provided with a field emission gun (FEG) for atomic resolution. For the analytical EM, a thermal FEG with high current density is naturally required. Also, a UHV specimen chamber is required for contamination-free atomic resolution observation. Given these requirements, we need two types of sputter ion pump (SIP), one for extremely low-pressure operation and the other for pumping argon or xenon gas for specimen thinning. We successfully developed two types of SIP for JEOL EMs (JEMs). I believe that UHV technology supports the analytical electron microscope (AEM) with an extremely high resolution of 0.1 nm.

This book describes the JEOL UHV technology for JEMs. I am confident that the technology described in this book will serve well for many kinds of scientific instruments because many of them require silent UHV pumps at a reasonable cost and clean UHV evacuation systems with safety systems so that no errors will occur in controlling the vacuum system. There are many kinds of scientific instruments requiring a UHV environment.

Many readers are very much interested in electron microscope technology itself. The monograph “Progress of electron microscope technology in Japan” was issued as a supplement to the journal *Microscopy* [Ref. [1] of Chap. 2], and contains many epoch-making TEM/STEM image photographs. The monograph cites a surprising number of references—as many as 297 papers and monographs. The English version of the “Progress of electron microscope technology in Japan” would be very useful for engineers and researchers worldwide.

As the author of the present volume, I am very grateful to the Microscopy Society of Japan for making it possible to include two figures: Fig. 2.1 and Fig. 2.7 ([1] in Chap. 2).

About the Author

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1965: Graduated from Osaka Prefecture University, Engineering Division

1965: Entered JEOL Ltd

1985: Received Doctor of Engineering degree from Osaka Prefecture University.
Ph.D. Thesis: “Research and Development of the High-Vacuum System of Electron Microscopes” (in Japanese)

1995: Qualified as a consultant engineer in physical field by passing the qualifying examination

1965–2002: Engaged in research and development of vacuum-related technology in electron microscopes for more than 35 years at JEOL-group companies

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