

## 2-4 Development of Radionuclide Migration Database

### — Update of Sorption/Diffusion Database Categorized by QA —

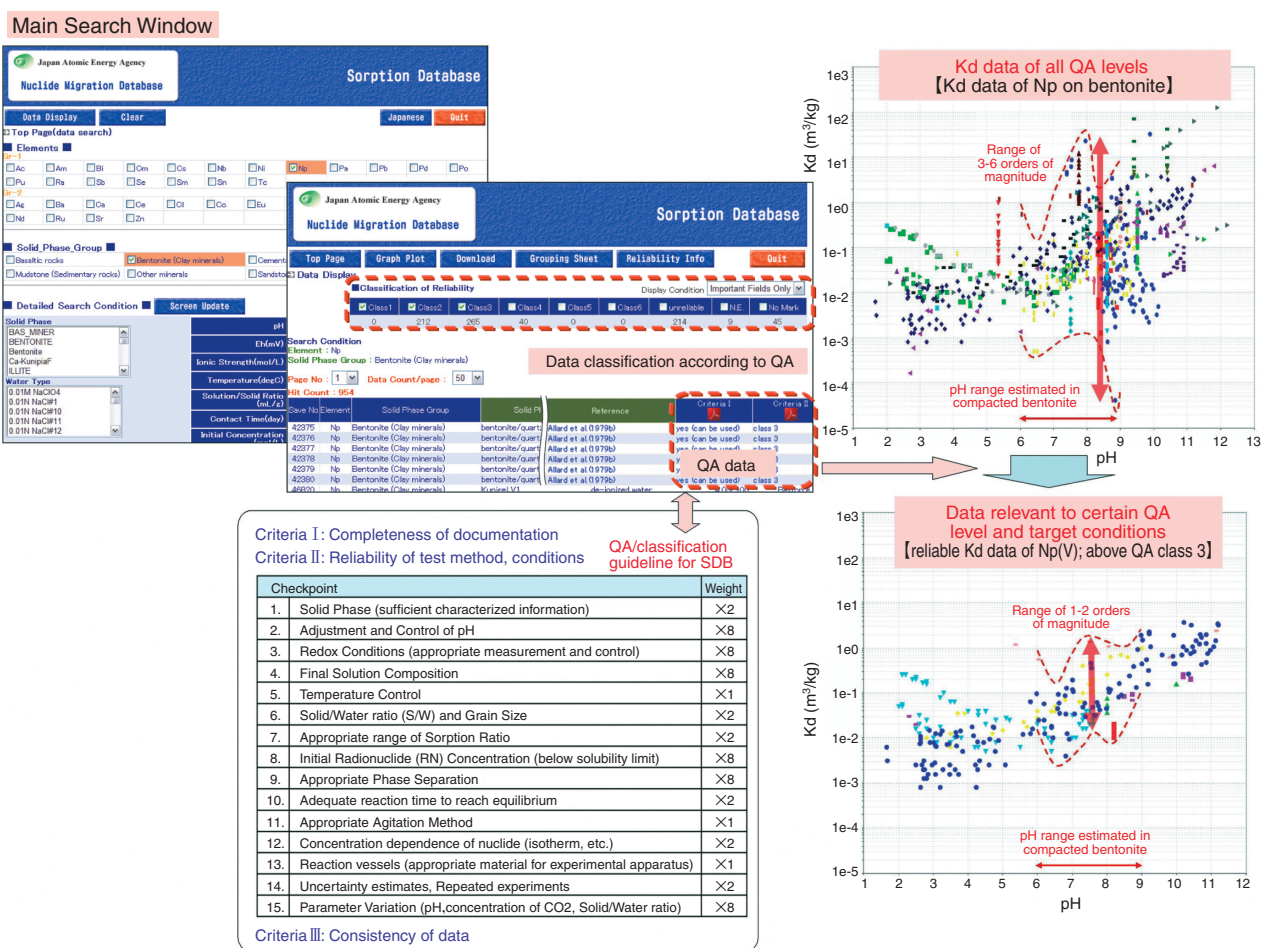


Fig.2-11 The new web-based JAEA-SDB - Examples of search, extraction of data relevant to QA level

Sorption and diffusion of radionuclides in buffer materials (bentonite) and rocks are key processes to be considered in the safe geological disposal of radioactive waste. Sorption and diffusion databases have been developed as an important basis for the H12 performance assessment (PA) of high-level radioactive waste disposal in Japan. We have developed a practical and reliable sorption and diffusion database (JAEA-SDB/DDB), improving the existing SDB/DDB in view of potential future data utilization, e.g. attaining a desired quality assurance (QA) level and setting migration parameters for geological environments.

The updated SDB/DDB includes 24,000  $K_d$  values (distribution coefficients) and 3,000  $D_e/D_a$  values (diffusion coefficients) and related experimental information from many different sources. The following functions are key improved points;

- (1) Consistency and linkage between SDB and DDB
- (2) Quality assurance evaluation method, utilization of QA results

- (3) Estimating of parameters and graphing of relation between parameters
- (4) Compiling sources and making data summary charts

The SDB includes a great variety of  $K_d$ s of different reliability levels which were obtained with various conditions and methods. Accordingly, a QA evaluation method for sorption data has been developed in order to evaluate the reliability of each  $K_d$ . The QA guideline consists of three main criteria; I: completeness of documentation, II: reliability of test methods and conditions, III: consistency of data. The reliability of  $K_d$  data in the SDB was evaluated based on the guideline, and the QA results were added to the SDB. As shown in Fig.2-11, this QA scheme makes it possible to extract reliable data for parameter-setting in an effective, traceable and transparent manner.

The new web-based JAEA-SDB/DDB have Japanese/English versions and are provided free on the web (<http://migrationdb.jaea.go.jp/>).

#### Reference

Tachi, Y., Tochigi, Y., Suyama, T. et al., Development of the Sorption and Diffusion Database System for Safety Assessment of Geological Disposal, JAEA-Data/Code 2008-034, 2009, 36p. (in Japanese).