Abstract:

Although there are competent calligraphers at our time, their valuable works usually suffer from untimely damages like becoming flaked off, color change and even degeneration of the paper support. This may results from inferior ink, heterogeneity of the materials used in ink making, poor viscosity and turning matte of ink soon after drying. In the present study, it was examined technically why black and brown inks- more frequently used in calligraphy works than other ones- lose their quality. In doing so, physical as well as chemical techniques were used. In chemical techniques, atomic absorption spectrometry apparatus, X-ray spectrometry, Fourier transform infrared spectroscopy and chromatography were used. Also, in physical techniques,in order to measure glossiness, covering power and viscosity of the samples, "glassymeter", "reflectometer" and **"**Ford Cup" apparatus (viscosimeter) were used respectively. The results from the chemical examinations showed that there was a synthetic pigment along with a binder in brown samples. Similarly, in black samples, instead of black pigment, a black material (probably soot; except one case) was found. Also, physical examinations revealed poor glossiness, covering power and viscosity of the available commercial inks. In the second step, the damages were examined. For this purpose, light, temperature and moisture tests were conducted on the samples. Each of the samples, depending on the chemical composition, experienced different damages including color change, growing mould, cracking, flaking off and going powdery. Finally, two samples of brown and black ink were planned to be made. It was supposed that even very small amount of a constituent such as henna, saffron, honey, etc, can change the final quality of ink. Keeping this in mind, old treatises on ink making were compared and contrasted so that, with the previous results from physical-chemical examinations, quality inks may be provided. In conclusion, it was made clear that the quantity of each constituent may change the final quality of ink far beyond the generally-held expectation. Data was based on library material, Internet sources and field observations and was processed by analytic-descriptive methods.

Key words: Calligraphy, Persian Ink, Brown Ink, Black Ink, Pathology, Thecnology