COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Manganese(II) selenite; $MnSeO_3$; [15702-34-8] 2a. Sulfuric acid; H_2SO_4; [7664-93-9] 2b. Hydrochloric acid; HCl; [7647-01-0] 3. Water; H_2O; [7732-18-5]	Chukhlantsev, V.G.; Tomashevsky, G.P. *Zh. Anal. Khim.* <u>1957</u>, *12*, 296-301; *J. Anal. Chem. USSR* <u>1957</u>, *12*, 303-9.

VARIABLES:	PREPARED BY:
Sulfuric and hydrochloric acid concentrations One temperature: 293 K	Mary R. Masson

EXPERIMENTAL VALUES:

All concentrations are expressed in units of mol dm^{-3}.

Soln.	Initial pH	Final pH	$[Mn^{2+}]$	pMn	log $\alpha_{L(H)}$	$p[SeO_3^{2-}]$	pK_{s0}
H_2SO_4	2.69	6.07	3.1×10^{-3}	2.51	1.94	4.45	6.96
	2.06	4.35	2.8×10^{-2}	1.55	3.63	5.18	6.73
HCl	2.79	6.24	2.2×10^{-3}	2.66	1.77	4.43	7.09
	2.41	5.37	6.8×10^{-3}	2.17	2.60	4.77	6.94
	2.05	4.42	2.1×10^{-2}	1.68	3.58	5.26	6.94

The average value is $K_{s0} = 1.2 \times 10^{-7}$ $mol^2 dm^{-6}$.

$$(pK_{s0} = 6.9)$$

Notes.

$[Se_{tot}] = [Mn^{2+}]$ and $[SeO_3^{2-}] = [Se_{tot}]/\alpha_{L(H)}$

where $\alpha_{L(H)} = (1 + [H^+]/K_2 + [H^+]^2/K_1K_2)$

and the acid dissociation constants have the values $K_1 = 4 \times 10^{-3}$ and

$K_2 = 1.0 \times 10^{-8}$ (ref. 1).

AUXILIARY INFORMATION

METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Solutions of sulfuric and hydrochloric acid were saturated with manganese(II) selenite by shaking in a thermostat at 20 $\pm$0.05°C for 8 hr. The remaining solid phase was removed by centrifugation, then the pH was measured ("Moskip" pH meter, to 0.01 pH unit) and the manganese concentration was determined spectrophotometrically, after oxidation to Mn(VII) with ammonium persulfate.	C.P.-grade reagents were used. Manganese selenite was prepared by mixing stoichiometric amounts of 0.2N manganese(II) sulfate and 0.2N sodium selenite, and heating the solution to 50 - 70°C. After prolonged standing, the precipitate was washed with water and dried at 40°C. Manganese was determined gravimetrically as the sulfate, and selenium as the element.

ESTIMATED ERROR:
$\pm$0.4 $\times 10^{-7}$. (The spread in the results is 0.36 of a log unit.) Temperature: $\pm$0.05 K

REFERENCES:
1. Rumpf, P. *Compt. Rendu* <u>1933</u>, *197*, 686.