

<p>COMPONENTS:</p> <p>(1) Iron; Fe; [7439-89-6]  (2) Mercury; Hg; [7439-97-6]</p>	<p>EVALUATOR:</p> <p>C. Guminski; Z. Galus  Department of Chemistry  University of Warsaw  Warsaw, Poland</p> <p>July, 1985</p>
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## CRITICAL EVALUATION:

Early reports of the solubility of iron in mercury in the region of room temperature varied over a range from  $4.1 \times 10^{-17}$  to 6.39 at % (1-4). These results are all rejected because they are either much too low or too high as compared to recent more precise measurements. In some instances only the solubility limits were stated because the analytical methods could not detect the low solubility of iron near room temperature; the solubility limits reported varied from  $10^{-6}$  to  $10^{-3}$  at % in this temperature region (5-8). Palmaer (9) employed analytical methods and reported that the iron content in saturated iron amalgams remained nearly constant at about  $2.5 \times 10^{-4}$  at % between 293 and 484 K; this result is too high and is rejected. Kozin's (28) calculated solubility of  $1.4 \times 10^{-4}$  at % at 298 K is too high.

Marshall and coworkers (10) determined the solubility of iron between 298 and 973 K, and these authors observed an increase from  $5.4 \times 10^{-6}$  to  $3.4 \times 10^{-4}$  at %, respectively, in this temperature range. The data of (10) at temperatures below 700 K are clearly overstated, while the data at temperatures higher than 700 K are in good agreement with the subsequent works of Weeks and coworkers (11-14).

Weeks (11) graphically summarized the iron solubility determinations made at the Brookhaven National Laboratories by he and his coworkers (12-14). Numerical data were reported only at 873 and 923 K where the solubilities were  $1.8 \times 10^{-4}$  (12) and  $2.7 \times 10^{-4}$  at % (14), respectively. Earlier, preliminary results by these workers (15,16) are rejected because of the large scatter in the data. Nerad (17), without giving any experimental details, reported iron solubilities of  $6.1 \times 10^{-5}$  and  $1.5 \times 10^{-4}$  at % at 755 and 856 K, respectively; these solubilities are in good agreement with (10) and (11).

Wang (18) reported a solubility of  $2.0 \times 10^{-4}$  at % at 644 K, and Bowersox and Leary (19) determined a value of  $5 \times 10^{-5}$  at % at 623 K. Both these results are higher than the solubilities reported by (10); the result of (18) is rejected because it is too high as compared to the other measurements.

Parkman (20), using iron from two different sources, determined the iron solubility at several temperatures and at different equilibration times, but no definite conclusions may be made from the results of this study. Jangg and coworkers (21) reported that the iron content in saturated amalgams between 973 and 1073 K was less than  $2 \times 10^{-4}$  at %.

Because the scatter in the iron solubility data is large, it is difficult to make clear recommendations for the solubilities of this metal in mercury. There is an especial need for more precise measurements at temperatures below 573 K. Luborsky (22) found that a gel-like iron amalgam, which contained 1% Fe, was stable for long periods at room temperature, even though the apparent solubility was exceeded by more than a millionfold. In this instance, the particle size of the iron is about 2 nm in diameter and filtration through sintered glass does not appreciably change the composition. This formation of very fine crystallites of iron in the amalgam is the reason why almost all solubility determinations at the lower temperatures are strongly overstated.

Horsley (23) analyzed the data of (10) and reported iron solubility of  $(0.27-6.8) \times 10^{-4}$  at % between 673 and 1073 K. This author also calculated grain boundary solubilities of  $(1.5-13.6) \times 10^{-4}$  at % in this temperature range.

Gudtsov and Gavze (24, 25) investigated the solubility of steels in mercury, and they reported the content of iron in the mercury phase after hundreds of hours of contact at 673 to 1023 K. The authors found no evident dependence of the solubility on temperature, time of contact, or the composition of the steel; they reported solubilities ranging from  $(0.109-8.4) \times 10^{-4}$  at %. Similar experiments were performed by Smith and Thompson (26) and by Parkman (20, 27). The solubilities obtained by (24, 25) are significantly higher than the solubility of pure iron; e.g.,  $6.2 \times 10^{-2}$  at % for technical iron at 923 K as compared to  $1.7 \times 10^{-4}$  at % (11). On the other hand, (20, 27) found the solubility of technical iron to be of similar magnitude as that for pure iron.

Iron does not form any intermetallic compounds with mercury, and pure iron is in equilibrium with the liquid phase (8, 21, 24, 29).

(Continued next page)

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(1) Iron; Fe; [7439-89-6]	C. Guminski; Z. Galus Department of Chemistry University of Warsaw Warsaw, Poland																
(2) Mercury; Hg; [7439-97-6]																	
July, 1985																	
CRITICAL EVALUATION: (Continued)																	
Tentative values of iron solubility in mercury:																	
	<table border="1"> <thead> <tr> <th><u>T/K</u></th> <th><u>Soly/at %</u></th> <th><u>Reference</u></th> </tr> </thead> <tbody> <tr> <td>673</td> <td><math>4 \times 10^{-5}</math></td> <td>[10]</td> </tr> <tr> <td>773</td> <td><math>9 \times 10^{-5a}</math></td> <td>[10,11,12]</td> </tr> <tr> <td>873</td> <td><math>2 \times 10^{-4}</math></td> <td>[11]</td> </tr> <tr> <td>973</td> <td><math>3.5 \times 10^{-4}</math></td> <td>[10]</td> </tr> </tbody> </table>	<u>T/K</u>	<u>Soly/at %</u>	<u>Reference</u>	673	$4 \times 10^{-5}$	[10]	773	$9 \times 10^{-5a}$	[10,11,12]	873	$2 \times 10^{-4}$	[11]	973	$3.5 \times 10^{-4}$	[10]	
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<sup>a</sup> Interpolated value from data of cited references.																	
References																	
<ol style="list-style-type: none"> <li>1. Tammann, G.; Kollmann, K. <i>Z. Anorg. Chem.</i> <u>1927</u>, <u>160</u>, 242.</li> <li>2. Richards, T.W.; Garrod-Thomas, R.N. <i>Z. Phys. Chem.</i> <u>1910</u>, <u>72</u>, 181.</li> <li>3. Tammann, G.; Oelsen, W. <i>Z. Anorg. Chem.</i> <u>1930</u>, <u>186</u>, 257.</li> <li>4. Nagaoka, H. <i>Ann. Phys. Chem.</i> <u>1896</u>, <u>59</u>, 66.</li> <li>5. Gouy, M. <i>J. Phys.</i> <u>1895</u>, <u>4</u>, 320.</li> <li>6. Irvin, N.M.; Russell, A.S. <i>J. Chem. Soc.</i> <u>1932</u>, 891.</li> <li>7. Strachan, J.F.; Harris, N.L. <i>J. Inst. Metals</i> <u>1956-57</u>, <u>85</u>, 17.</li> <li>8. de Wet, J.F.; Haul, R.A.W. <i>Z. Anorg. Chem.</i> <u>1954</u>, <u>277</u>, 96.</li> <li>9. Palmaer, E. <i>Z. Elektrochem.</i> <u>1932</u>, <u>38</u>, 70.</li> <li>10. Marshall, A.L.; Epstein, L.F.; Norton, F.J. <i>J. Am. Chem. Soc.</i> <u>1950</u>, <u>72</u>, 3514.</li> <li>11. Weeks, J.R. <i>Corrosion</i> <u>1967</u>, <u>23</u>, 98.</li> <li>12. Weeks, J.R. <i>U.S. At. Ener. Comm. Rep.</i>, <i>NASA-SP-41</i>, <u>1963</u>, p. 21; <i>U.S. At. Ener. Comm. Rep.</i>, <i>BNL-7553</i>, <u>1963</u>.</li> <li>13. Weeks, J.R.; Minardi, A.; Fink, S. <i>U.S. At. Ener. Comm. Rep.</i>, <i>BNL-759</i>, <u>1962</u>, p. 63.</li> <li>14. Weeks, J.R.; Fink, S. <i>U.S. At. Ener. Comm. Rep.</i>, <i>BNL-900</i>, <u>1964</u>, p. 136.</li> <li>15. Fleitman, A.H.; Romano, A.; Klamut, C. <i>U.S. At. Ener. Comm. Rep.</i>, <i>TID-7626</i>, <u>1962</u>, Pt. I, p. 24.</li> <li>16. Weeks, J.R.; Fink, S.; Minardi, A. <i>U.S. At. Ener. Comm. Rep.</i>, <i>BNL-705</i>, <u>1961</u>, p. 56.</li> <li>17. Nerad, A.J., as cited by A. H. Fleitman, J.R. Weeks, <i>Nucl. Eng. Des.</i> <u>1971</u>, <u>16</u>, 166.</li> <li>18. Wang, J.Y.N. <i>Nucl. Sci. Eng.</i> <u>1964</u>, <u>18</u>, 18.</li> <li>19. Bowersox, D.F.; Leary, J.A. <i>U.S. At. Ener. Comm. Rep.</i>, <i>LAMS-2518</i>, <u>1961</u>.</li> <li>20. Parkman, M.F. <i>Extended Abst., Electrothermics and Metallurgy Div.</i>, <i>Vol. 2, No. 2</i>, The Electrochemical Soc., New York, NY, <u>1964</u>, pp. 16-21.</li> <li>21. Jangg, G.; Fitzer, E.; Adlhart, O.; Hohn, H. <i>Z. Metallk.</i> <u>1958</u>, <u>49</u>, 557.</li> <li>22. Luborsky, E. <i>J. Phys. Chem.</i> <u>1958</u>, <u>61</u>, 1336.</li> <li>23. Horsley, G.W. <i>J. Nucl. Energy, Part B</i> <u>1959</u>, <u>1</u>, 84.</li> <li>24. Gudtsov, N.T.; Gavze, M.N. <i>Izv. Akad. Nauk SSSR, Otd. Tekhn. Nauk</i> <u>1952</u>, 67.</li> <li>25. Gudtsov, N.T.; Gavze, M.N. <i>Vozdeistvie rtuti kak teplonositelya na stal v energeticheskiikh ustanovkakh</i>, Izdatelstvo AN SSSR, Moskva, <u>1956</u>, p. 16; <i>2nd Edition</i>, <u>1963</u>, p. 59.</li> <li>26. Smith, A.R.; Thompson, E.S. <i>Trans. ASME</i> <u>1942</u>, <u>64</u>, 625.</li> <li>27. Parkman, M.F.; Whaley, D.K. <i>Aerojet-General Nucleonics, Rep. AN-957</i>, <u>1963</u>.</li> <li>28. Kozin, L.F. <i>Fiziko-Khimicheskie Osnovy Amalgamoi Metallurgii</i>, Nauka, Alma-Ata, <u>1964</u>.</li> <li>29. Lihl, F. <i>Z. Metallk.</i> <u>1953</u>, <u>44</u>, 160.</li> </ol>																	

COMPONENTS:		ORIGINAL MEASUREMENTS:										
(1) Iron; Fe; [7439-89-6] (2) Mercury; Hg; [7439-97-6]		Marshall, A.L.; Epstein, L.F.; Norton, F.J. <i>J. Am. Chem. Soc.</i> <u>1950</u> , <i>72</i> , 3514-16.										
VARIABLES:		PREPARED BY:										
Temperature: 25-700°C		C. Guminski; Z. Galus										
EXPERIMENTAL VALUES:												
<u>Experimental Solubility of Iron in Mercury</u>												
$t/^{\circ}\text{C}$	25	25	25	250	250	425	500	500	500	700	700	
g Fe/10 <sup>6</sup> g Hg	0.013	0.015	0.017	0.037	0.066	0.105	0.105	0.225	0.270	1.0	1.2	
<u>Smoothed Solubility of Iron in Mercury</u>												
$t/^{\circ}\text{C}$	25	100	200	300	400	500	600	700				
g Fe/10 <sup>6</sup> Hg	0.015	0.019	0.030	0.054	0.11	0.21	0.45	0.96				
<sup>a</sup> Soly/at % x 10 <sup>5</sup>	0.54	0.68	1.1	1.9	3.9	7.5	16	34				
<sup>a</sup> by compilers.												
AUXILIARY INFORMATION												
METHOD/APPARATUS/PROCEDURE:					SOURCE AND PURITY OF MATERIALS:							
Carefully deoxygenated iron cylinder was equilibrated with Hg in evacuated quartz bulbs for several hours to a month. Care was taken to assure wetting of iron. Bulb was sealed in a steel bomb with Hg to equalize pressure at high temperatures, and the bomb was rocked in the furnace to assure equilibrium. Finally, the bomb was tilted at temperature to separate the amalgam from the iron, and then cooled to remove the sample for analysis. After opening the bulb the iron was removed and the Hg distilled, collected and weighed. The iron was determined colorimetrically by complex formation with KCNS.					Redistilled Hg of original high purity, and pure Swedish iron were used.							
					ESTIMATED ERROR:							
					Soly: precision as high as $\pm$ 50%. Temp: nothing specified.							
REFERENCES:												

<b>COMPONENTS:</b> (1) Iron; Fe; [7439-89-6] (2) Mercury; Hg; [7439-97-6]	<b>ORIGINAL MEASUREMENTS:</b> 1. Weeks, J.R. <i>Corrosion</i> 1967, 23, 98-106. 2. Weeks, J.R.; Minardi, A.; Fink, S. <i>U.S. At. Ener. Comm. Rep.</i> , BNL-759, 1962, p. 63.																								
<b>VARIABLES:</b> Temperature: 500-650°C	<b>PREPARED BY:</b> C. Guminski; Z. Galus																								
<b>EXPERIMENTAL VALUES:</b> <p>The mass % solubility was presented graphically as a function of temperature. The data points from the plot were read off and converted to atomic % by the compilers.</p> <table border="1" data-bbox="408 527 1092 819"> <thead> <tr> <th><math>t/^\circ\text{C}</math></th> <th><math>\text{Soly/mass \%} \times 10^5</math></th> <th><math>\text{Soly/at \%} \times 10^4</math></th> </tr> </thead> <tbody> <tr><td>500</td><td>2.0</td><td>0.72</td></tr> <tr><td>525</td><td>7.0</td><td>2.5</td></tr> <tr><td>550</td><td>2.2</td><td>0.79</td></tr> <tr><td>575</td><td>2.6</td><td>0.93</td></tr> <tr><td>600</td><td>5.5</td><td>2.0</td></tr> <tr><td>625</td><td>6.2</td><td>2.2</td></tr> <tr><td>650</td><td>4.8</td><td>1.7</td></tr> </tbody> </table>		$t/^\circ\text{C}$	$\text{Soly/mass \%} \times 10^5$	$\text{Soly/at \%} \times 10^4$	500	2.0	0.72	525	7.0	2.5	550	2.2	0.79	575	2.6	0.93	600	5.5	2.0	625	6.2	2.2	650	4.8	1.7
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<b>AUXILIARY INFORMATION</b>																									
<b>METHOD/APPARATUS/PROCEDURE:</b> Hg and Fe were placed into the larger chamber of a fused quartz capsule which was constructed so that a coarse quartz filter separated the two chambers. The capsule containing the metals was sealed under vacuum and placed in a stainless-steel capsule. Hg was also placed in the steel capsule before it was welded shut by tungsten-inert-gas welding. The capsule was placed in a furnace of a high temperature centrifuge and the sample was equilibrated for 72 hours. The sample was centrifuged after this period and the sat. amalgam was collected in the smaller quartz chamber. Hg from the weighed amount of amalgam was distilled off and the residue dissolved in $\text{HNO}_3\text{-HF}$ or aqua regia. Co or Y was added to the solution as internal standard and the Fe was determined spectrographically.	<b>SOURCE AND PURITY OF MATERIALS:</b> Mercury was triple-distilled, reagent grade.  Iron source and purity not specified, but specimens were first irradiated in the Brookhaven Graphite Research Reactor.  <b>ESTIMATED ERROR:</b> Soly: nothing specified. Temp: precision $\pm 2$ K.  <b>REFERENCES:</b>																								

<b>COMPONENTS:</b>  (1) Iron; Fe; [7439-89-6] (2) Mercury; Hg; [7439-97-6]	<b>ORIGINAL MEASUREMENTS:</b>  Bowersox, D.F.; Leary, J.A. <i>U.S. At. Ener. Comm. Rep., LAMS-2518,</i> <u>1961.</u>
<b>VARIABLES:</b>  One temperature: 350°C	<b>PREPARED BY:</b>  C. Guminski; Z. Galus
<b>EXPERIMENTAL VALUES:</b>  The solubility of iron in mercury at 350°C was reported to be $2 \times 10^{-3}$ g Fe/dm <sup>3</sup> Hg. The corresponding atomic % solubility calculated by the compilers is $5 \times 10^{-5}$ at %.	
<b>AUXILIARY INFORMATION</b>	
<b>METHOD/APPARATUS/PROCEDURE:</b>  The solubility was determined by immersing a weighed coupon of Fe into a known amount of boiling Hg and periodically measuring the coupon weight. The solubility of Fe was determined from the weight loss of the coupon.	<b>SOURCE AND PURITY OF MATERIALS:</b>  Mercury was triple-distilled material.  Iron purity not specified.  <b>ESTIMATED ERROR:</b> Soly: detection limit of method was $1 \times 10^{-3}$ g; precision may be no better than + 50%. Temp: nothing specified.  <b>REFERENCES:</b>

<b>COMPONENTS:</b> (1) Iron; Fe; [7439-89-6] (2) Mercury; Hg; [7439-97-6]	<b>ORIGINAL MEASUREMENTS:</b> Parkman, M.F. <i>Extended Abst., Electrothermics and Metallurgy Div., Vol. 2, No. 2, The Electrochemical Soc., New York, NY 1964, pp. 16-21.</i>																									
<b>VARIABLES:</b> Temperature: 855-896 K	<b>PREPARED BY:</b> C. Guminski; Z. Galus																									
<b>EXPERIMENTAL VALUES:</b> The mass % solubility data were presented graphically; the solubilities were read off the curve and converted to atomic % by the compilers. <table border="1" data-bbox="263 574 1191 764"> <thead> <tr> <th><u>T/K</u></th> <th><u>Fe Source</u></th> <th><u>Contact time, hrs.</u></th> <th><u>Soly/mass %</u></th> <th><u>Soly/at %</u></th> </tr> </thead> <tbody> <tr> <td>855</td> <td>Armco</td> <td>16</td> <td><math>9 \times 10^{-6}</math></td> <td><math>3.6 \times 10^{-5}</math></td> </tr> <tr> <td>855</td> <td>Armco</td> <td>16</td> <td><math>1.5 \times 10^{-5}</math></td> <td><math>6.0 \times 10^{-5}</math></td> </tr> <tr> <td>866</td> <td>Westinghouse</td> <td>64</td> <td><math>2.8 \times 10^{-5}</math></td> <td><math>1.1 \times 10^{-4}</math></td> </tr> <tr> <td>896</td> <td>Westinghouse</td> <td>132</td> <td><math>2.2 \times 10^{-5}</math></td> <td><math>8.8 \times 10^{-5}</math></td> </tr> </tbody> </table>		<u>T/K</u>	<u>Fe Source</u>	<u>Contact time, hrs.</u>	<u>Soly/mass %</u>	<u>Soly/at %</u>	855	Armco	16	$9 \times 10^{-6}$	$3.6 \times 10^{-5}$	855	Armco	16	$1.5 \times 10^{-5}$	$6.0 \times 10^{-5}$	866	Westinghouse	64	$2.8 \times 10^{-5}$	$1.1 \times 10^{-4}$	896	Westinghouse	132	$2.2 \times 10^{-5}$	$8.8 \times 10^{-5}$
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<b>AUXILIARY INFORMATION</b>																										
<b>METHOD/APPARATUS/PROCEDURE:</b> Specimen of Fe was placed in contact with Hg in a glass capsule and the Hg in the capsule was outgassed for at least 16 hours. The capsule was then sealed under vacuum. The capsule was placed in a copper block in a pressurized furnace and heated to the desired temperature and held there for 16 to 132 hours. A sample of the solution was then collected at temperature and cooled, and the Hg was separated from the sample by molecular distillation. The residue was dissolved into an acid solution and the Fe was determined by spectrophotometry.	<b>SOURCE AND PURITY OF MATERIALS:</b> Iron from Armco contained 0.01% C, 0.03% Mn, 0.02% Si, 0.007% P, 0.04% S, 0.0012% O. Iron from Westinghouse designated as "Puron". Mercury was probably triple-distilled. <b>ESTIMATED ERROR:</b> Soly: nothing specified. Temp: precision $\pm$ 3 K. <b>REFERENCES:</b>																									

<p>COMPONENTS:</p> <p>(1) Ruthenium; Ru; [7440-18-8]</p> <p>(2) Mercury; Hg; [7439-97-6]</p>	<p>EVALUATOR:</p> <p>C. Guminski; Z. Galus          Department of Chemistry          University of Warsaw          Warsaw, Poland</p> <p>July, 1985</p>
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## CRITICAL EVALUATION:

The few reports on the experimental determinations of the solubility of ruthenium in mercury are at wide variance. Strachan and Harris (1) reported a solubility of 0.694 at % at room temperature, but this result is clearly much too high. Jangg and Dörrbudak (2) could not detect any dissolution at 773 K; the detection limit for ruthenium by the latter authors was  $2 \times 10^{-5}$  at %. Bowersox and Leary (3) equilibrated the two metals at 293 and at 523 K, and they could not detect any dissolution of ruthenium at these temperatures. These authors concluded that the solubility was below their detection limit of  $3 \times 10^{-5}$  at %. It also was reported (4) that there was no attack of ruthenium by mercury at 823 K.

Dean (5) reported that the solubility of ruthenium is of the order of  $2 \times 10^{-7}$  at %, but the temperature and other experimental details were not specified. Messing and Dean (6) reported that the solubility of ruthenium in a saturated uranium amalgam varied from  $2.4 \times 10^{-3}$  at % at 323 K to  $2.2 \times 10^{-2}$  at % at 629 K.

Kozin predicted a solubility of  $1.2 \times 10^{-11}$  at % at 298 K (7); he previously predicted  $9.3 \times 10^{-17}$  at % at 298 K (8). The first value appears to be more reliable to the evaluators.

It is clear that there is no dependable solubility data in this system; it only may be stated that the solubility of ruthenium at 298 K is less than  $2 \times 10^{-5}$  at %.

The saturated amalgam is in equilibrium with pure ruthenium (2).

References

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2. Jangg, G.; Dörrbudak, T. *Z. Metallk.* 1973, 64, 715.
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<b>COMPONENTS:</b>  (1) Ruthenium; Ru; [7440-18-8] (2) Mercury; Hg; [7439-97-6]	<b>ORIGINAL MEASUREMENTS:</b>  Bowersox, D.F.; Leary, J.A. <i>U.S. At. Ener. Comm. Rep., LAMS-2518,</i> <u>1961.</u>
<b>VARIABLES:</b>  Temperature: 20-250°C	<b>PREPARED BY:</b>  C. Guminski; Z. Galus
<b>EXPERIMENTAL VALUES:</b>  <p>The solubility of ruthenium in mercury at 20 and 250°C was reported to be less than the detection limit of <math>2 \times 10^{-3}</math> g of Ru in <math>1 \text{ dm}^3</math> of Hg. The corresponding atomic % detection limit calculated by the compilers is <math>3 \times 10^{-5}</math> at %. Although Ru apparently dissolved in Hg at 350°C, it did not pass through a coarse Pyrex frit at either 30 or 350°C. Therefore, since the "solubility is considered to be the quantity that passes through such a frit, Ru would, by definition, be insoluble in Hg."</p>	
<b>AUXILIARY INFORMATION</b>	
<b>METHOD/APPARATUS/PROCEDURE:</b>  The solubility was determined by immersing a weighed coupon of Ru into a definite amount of Hg at specified temperatures. The coupon weight was measured periodically to determine the solubility from the weight loss.	<b>SOURCE AND PURITY OF MATERIALS:</b>  Triple-distilled Hg was used.  Ruthenium purity was not specified.  <b>ESTIMATED ERROR:</b> Soly: detection limit as specified above. Temp: not specified.  <b>REFERENCES:</b>



<b>COMPONENTS:</b>  (1) Osmium; Os; [7440-04-2] (2) Mercury; Hg; [7439-97-6]	<b>EVALUATOR:</b>  C. Guminski; Z. Galus Department of Chemistry University of Warsaw Warsaw, Poland  July, 1985
<b>CRITICAL EVALUATION:</b>  Jangg and Dörtbudak (1), in an equilibration study at 773 K, could not detect any dissolution of osmium in mercury at their analytical detection limit of $10^{-5}$ at %. The low solubility of osmium is also suggested by the estimate reported by Kozin (2) of $1.1 \times 10^{-14}$ at % at 298 K. The latter value appears to the evaluators to be more reliable than one predicted previously, i.e., $1.8 \times 10^{-22}$ at % at 298 K (3).  The saturated osmium amalgam is in equilibrium with pure osmium; no Os-Hg compounds were found (1).  <u>References</u>  1. Jangg, G.; Dörtbudak, T. <i>Z. Metallk.</i> <u>1973</u> , 64, 715. 2. Kozin, L.F. <i>Fiziko-Khimicheskie Osnovy Amalgamoi Metallurgii</i> , Nauka, Alma-Ata, <u>1964</u> . 3. Kozin, L.F. <i>Tr. Inst. Khim. Nauk Akad. Nauk Kaz. SSR</i> <u>1962</u> , 9, 101.	