BÖLÜM V
SANAYİ HAMMADDELERİ ve ÖNEMİ

Rezerv: maden yatağında bulunan madenin bileşik halindeki miktarı.

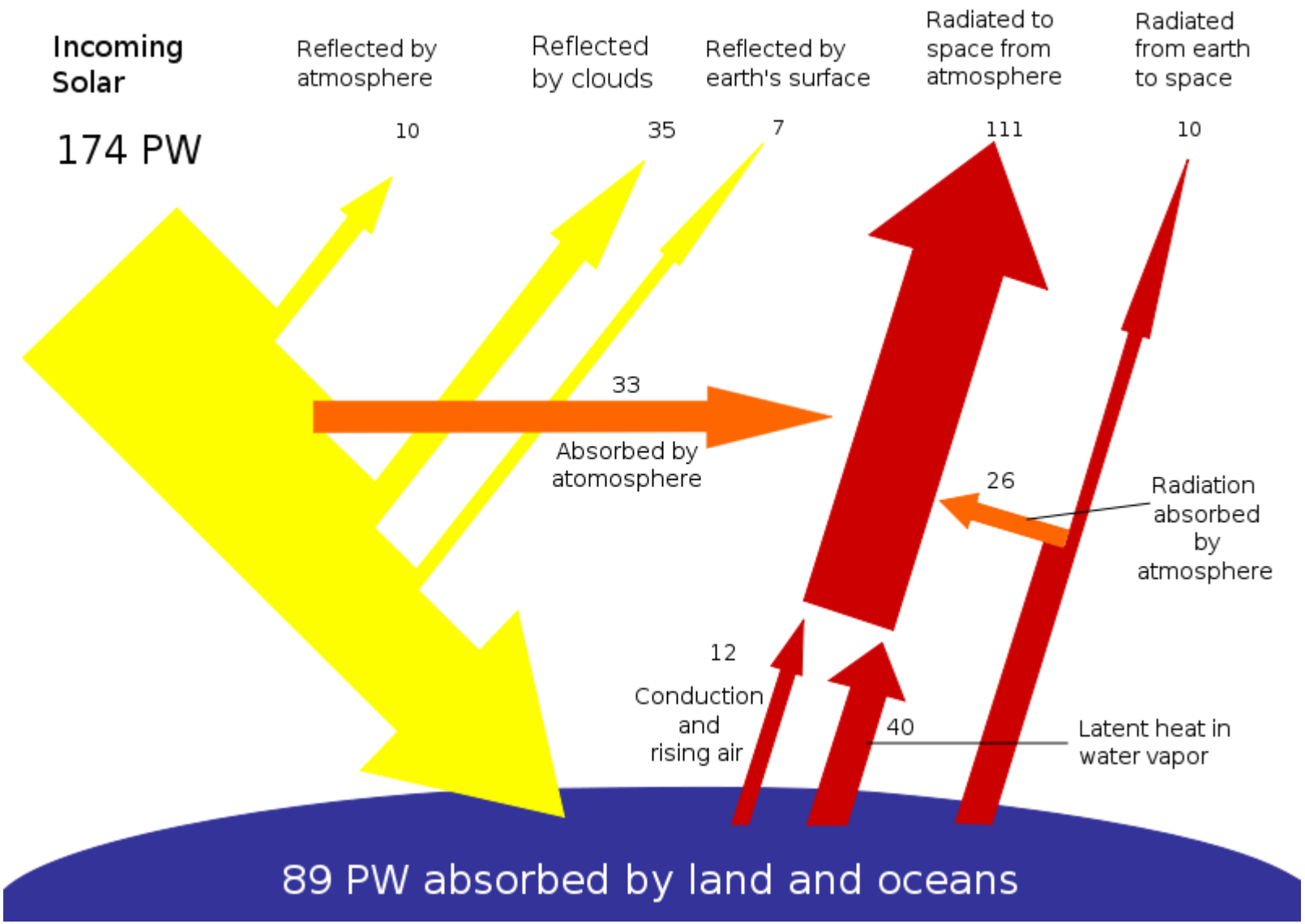
Tenör: Kütleden saf olarak elde edilecek miktar.

MADEN YATAKLARININ OLUŞUMU

Mineraller: Belli bir kimyasal bileşimi ve düzenli bir atomik yapısı olan ve çoğunlukla katı halde bulunan homojen cisimlerdir.

Kayalar: Bir veya birden fazla minerallin bir araya gelerek oluşturdukları kütlelerdir.

Enerji kaynakları



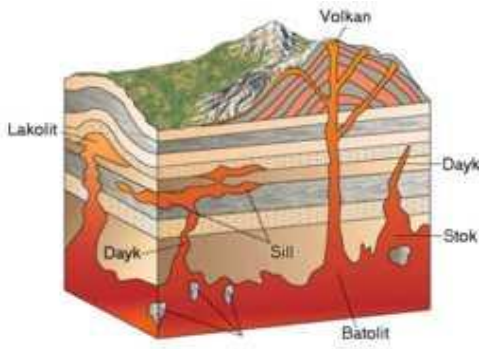
Magmatik olaylar

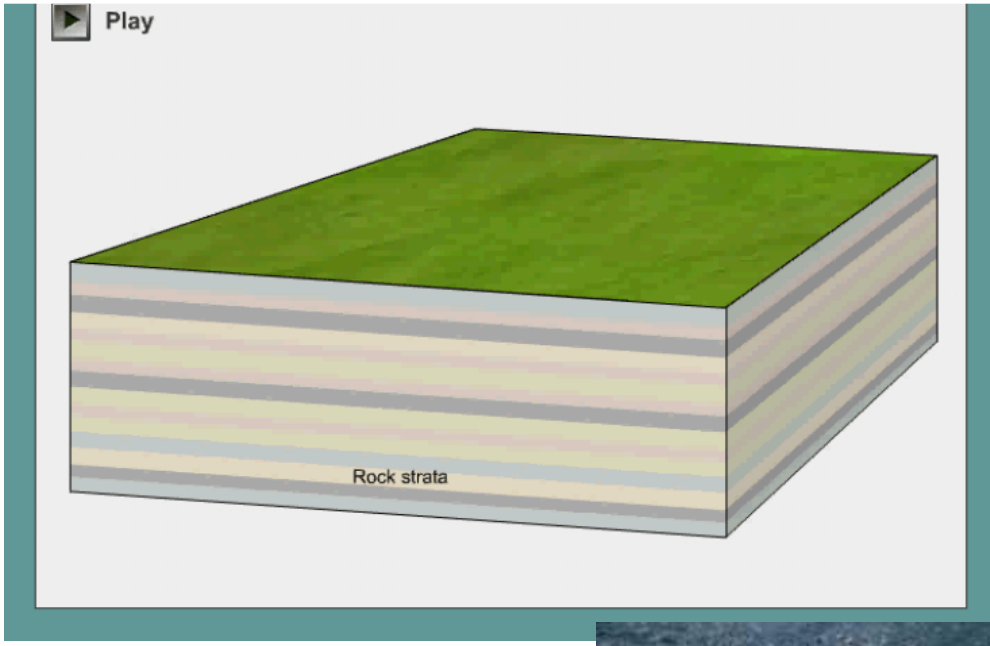
1. Derinlik kayaları (Plütonikler)

   Batolitler

   Lakolitler

   Dayklar





Hidrotermal Olaylar

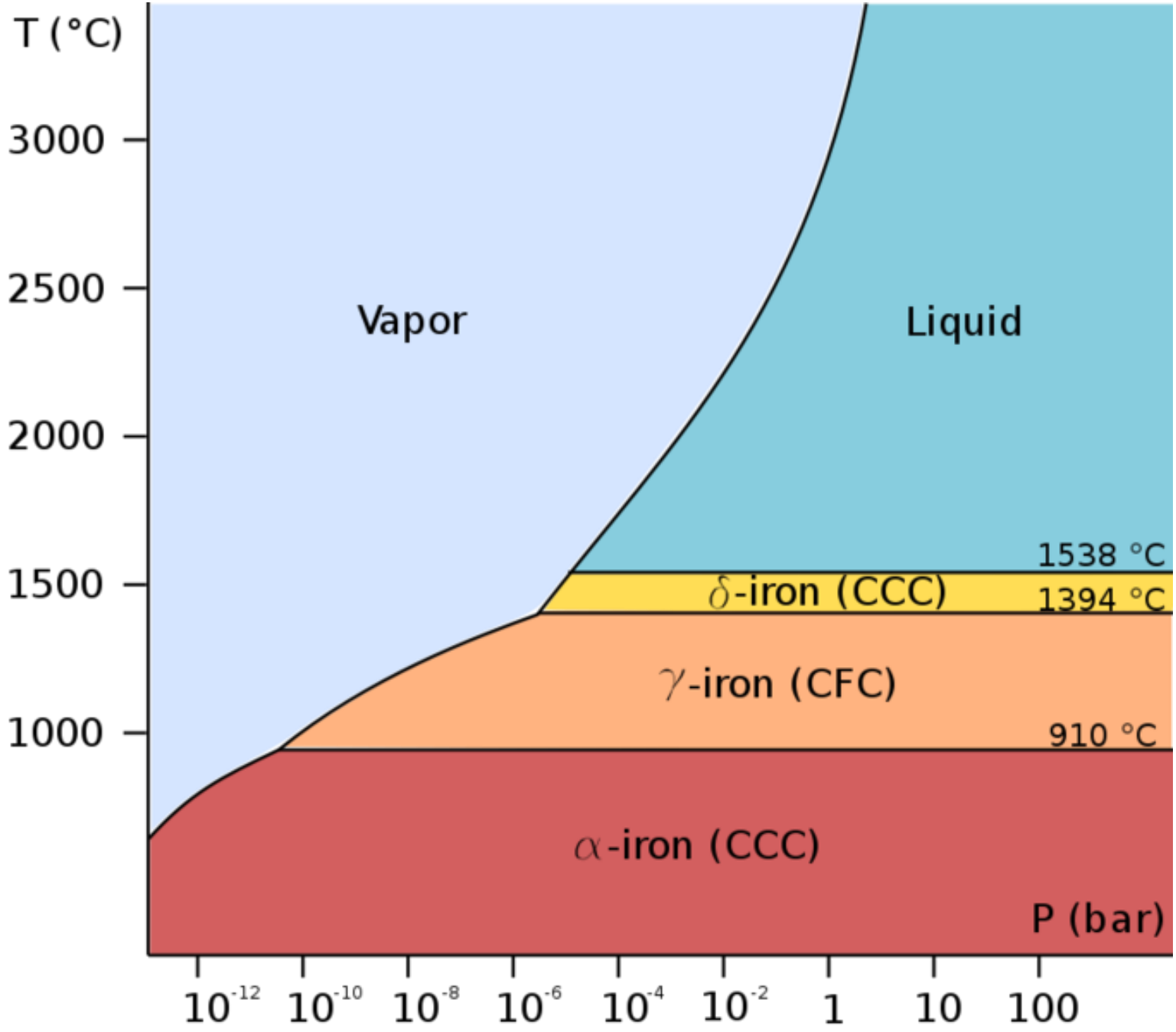
1. Volkanizma sırasında açığa çıkan gün görmemiş (Juvenil) suların yol açtığı hidrotermal olaylar
2. Yeraltı suyunun ısınmasıyla oluşan olaylar
3. Okyanus ortası püskürmeleriyle oluşan olaylar

Hidrotermal yoldan oluşan cevher tipleri

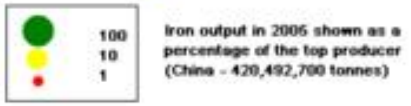
Arz kabuğu içine sokulmuş bir magma parçası olan intruzif kütlenin soğuyup normal kristalleşerek katılaşması sırasında (pegmatitik fazdan sonra) hidrotermal fazda su ve uçucu madde bakımından zenginleşmiş bakiye eriyiklerin; (intrüsif kütleden) çeşitli uzaklıklarda ve düşük sıcaklıklarda (400½C'in altında) oluşturduğu maden yatakları. Hidrotermal maden yatakları teşekkül sıcaklıklarına göre katatermal - (300½-400½C), mesotermal- (200½-300½C), epitermal - (100½-200½C) ve teletermal - (-100½C) maden yatakları diye isimlendirilir. Hidrotermal cevher yatakları, cevher cinslerine göre de; altın ve gümüş oluşumu, bakır ve pirit oluşumu, kurşun-gümüş-çinko oluşumu, gümüş-kobalt-nikel-bizmut-uranyum oluşumu, antimuan-civa-arsen-selen oluşumu, oksidik demir-magnezyum-mangan oluşumu, cevhersiz oluşum diye tanımlanır.

1. DEMİR CEVHERİ VE DEMİR ALAŞIMLARI

Hematit


T (°C)
3000
2500
2000
1500
1000
Vapor
Liquid
1538 °C
δ-iron (CCC)
1394 °C
γ-iron (CFC)
910 °C
α-iron (CCC)
P (bar)
10-12
10-10
10-8
10-6
10-4
10-2
1
10
100

Estimated iron ore production in million metric tons for 2009 according to U.S. Geological Survey[4]	
Country	Production
China	880
Australia	394
Brazil	300
India	245
Russia	92
Ukraine	66
South Africa	55
Iran	33
Canada	32
United States	27
Kazakhstan	22
Sweden	18
Venezuela	15
Mauritania	10
Other countries	43

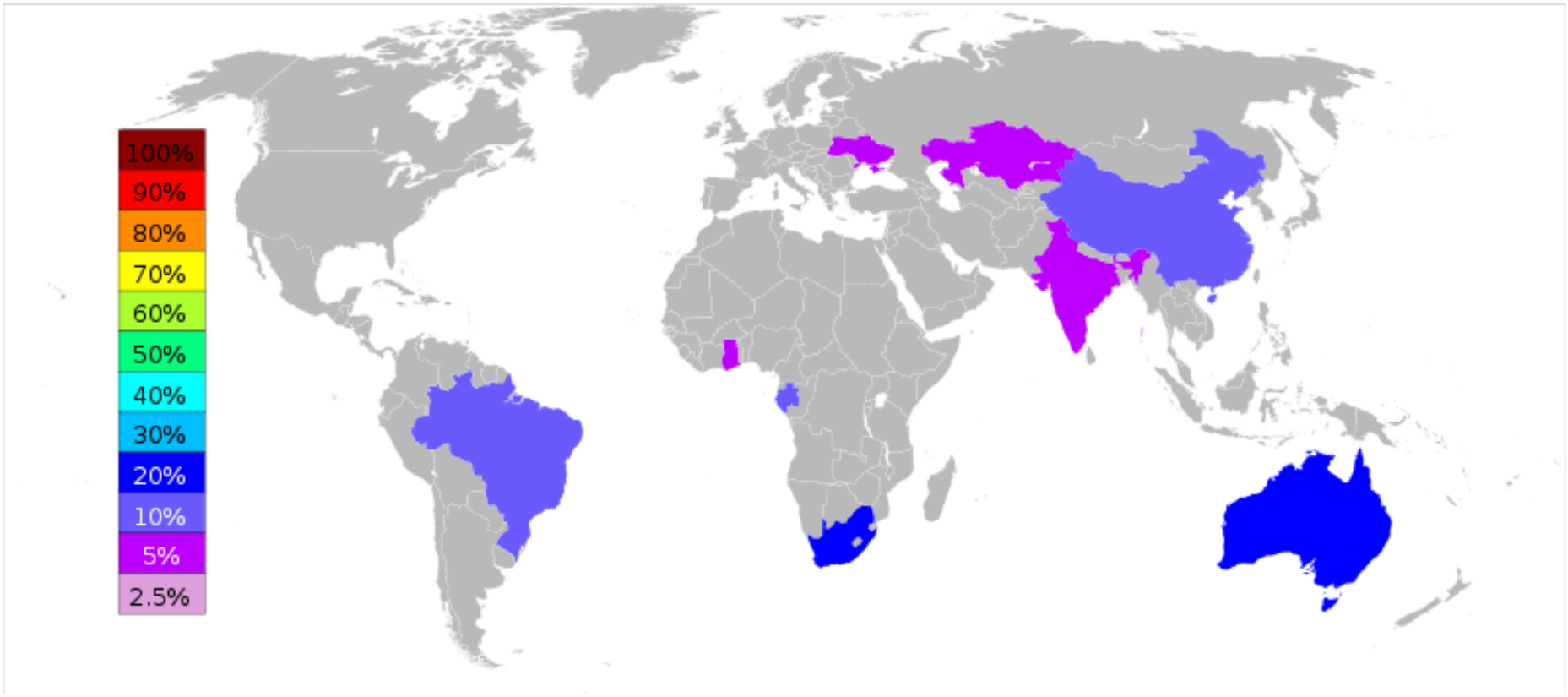


Iron output in 2005 shown as a percentage of the top producer (China - 420,492,700 tonnes)

2. DEMİR ALAŞIMLARI

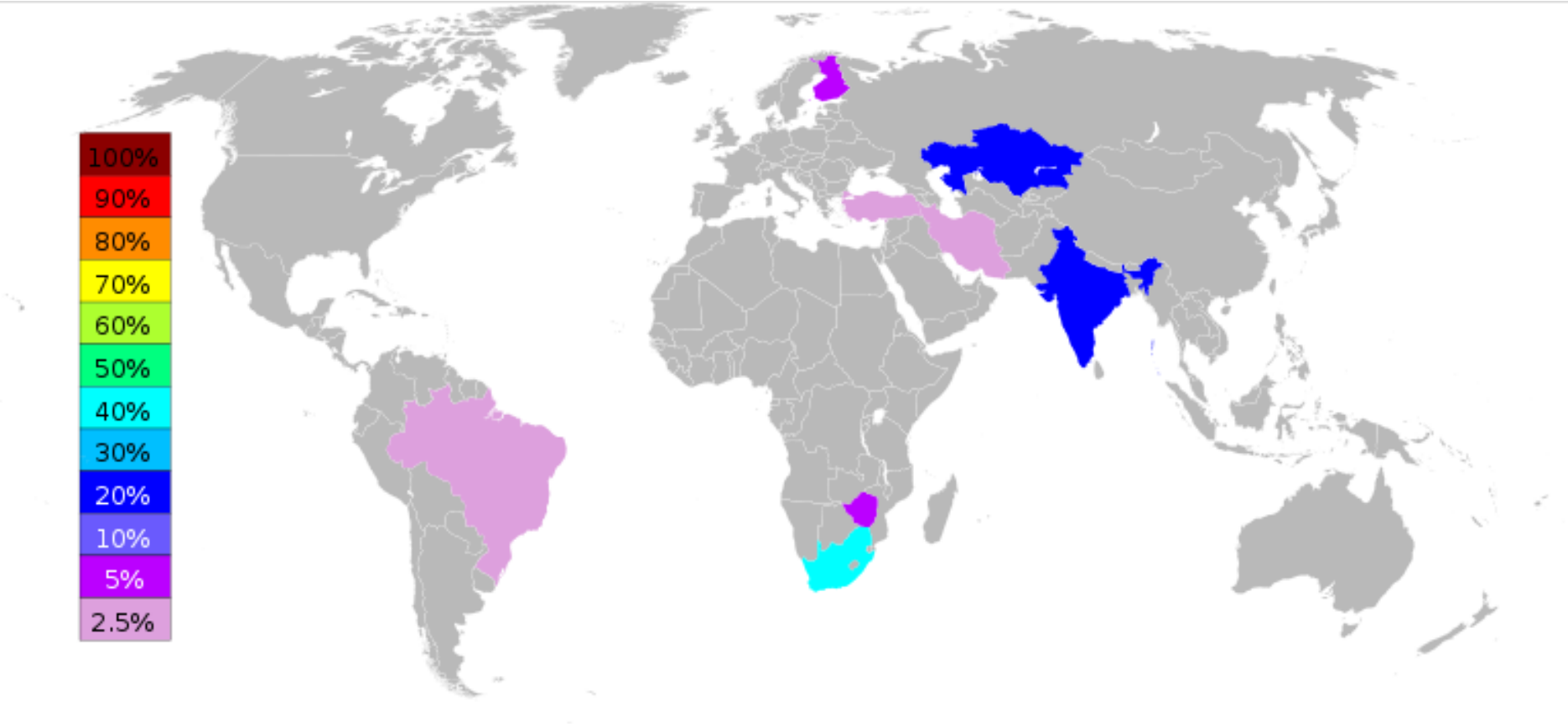
Manganez

World Manganese Production 2006

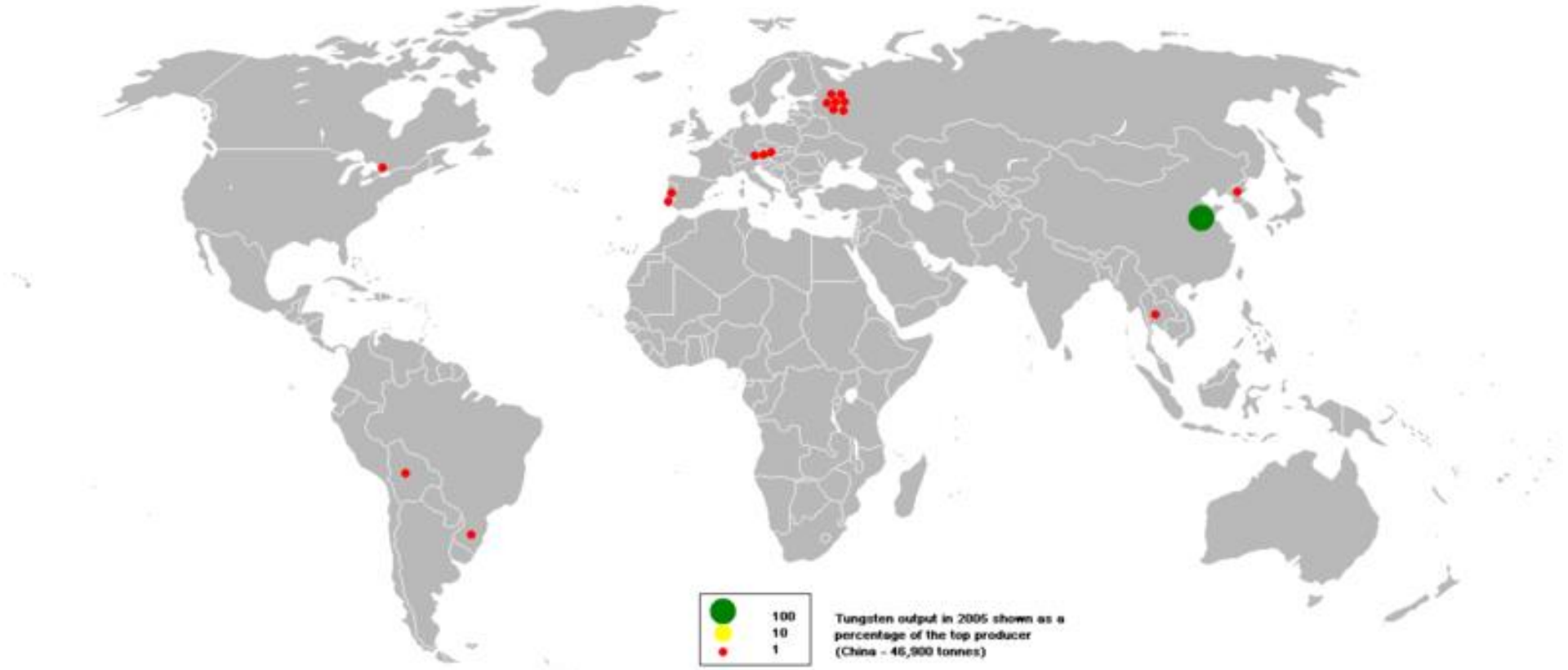


Krom

World Chromium Production 2002



Tungsten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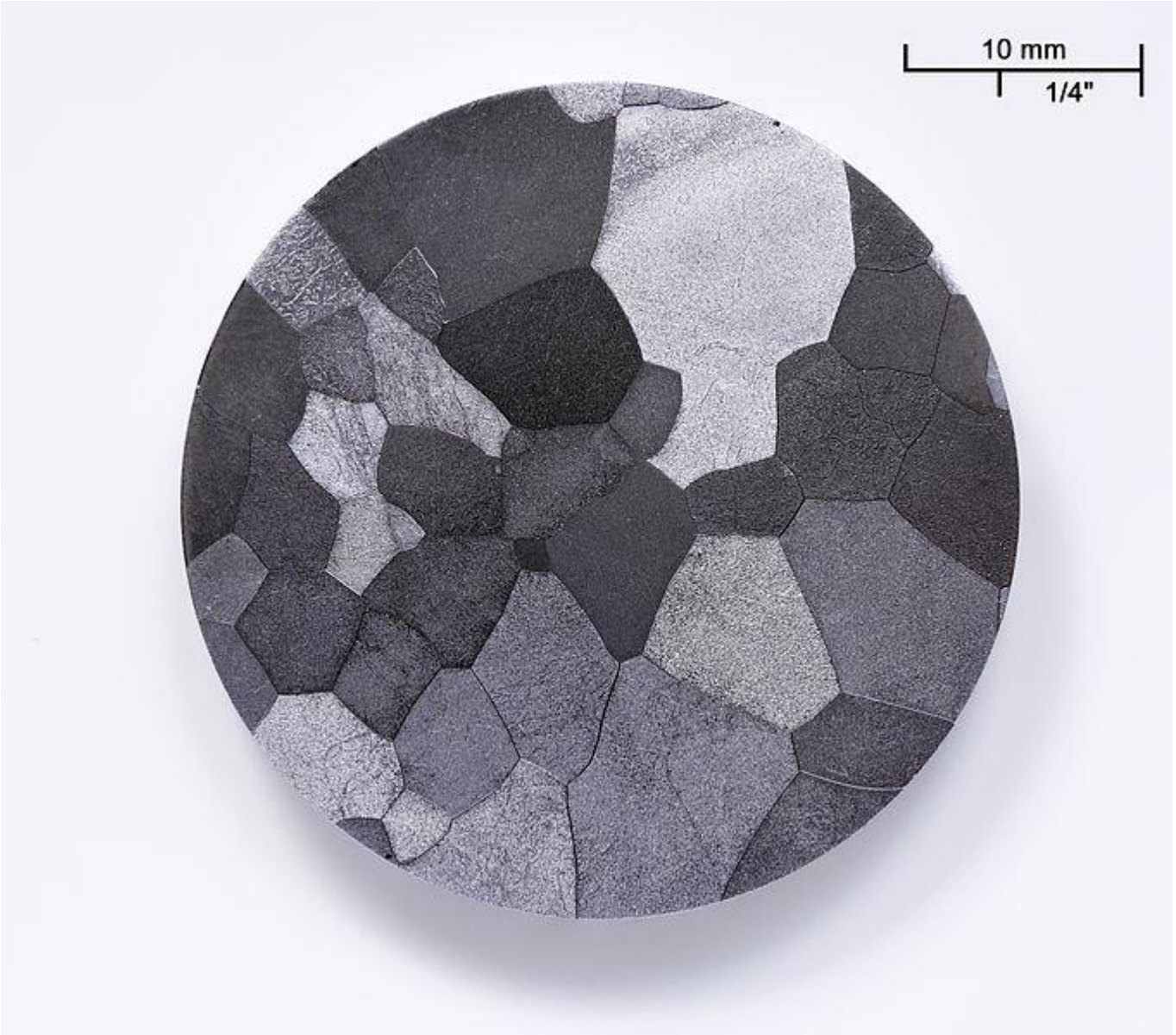
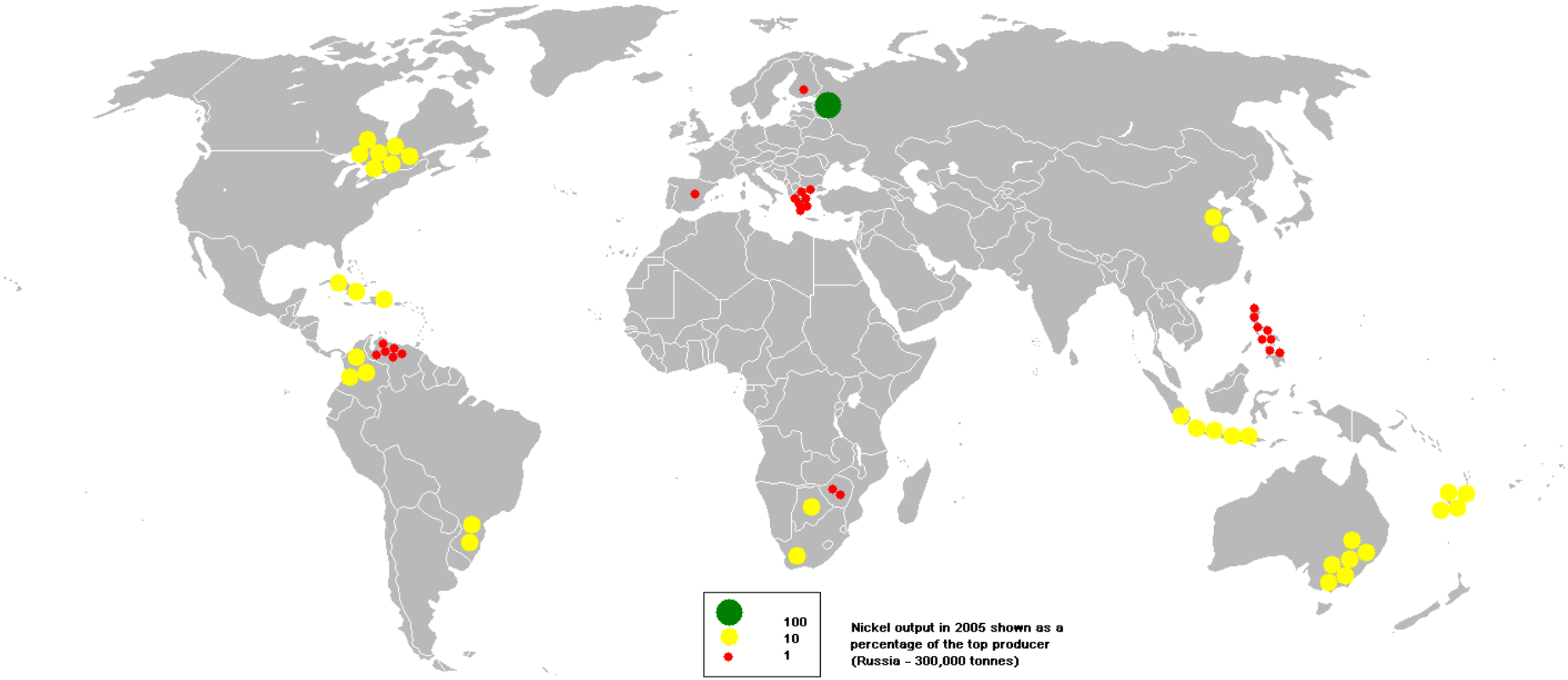
Tungsten output in 2005 shown as a percentage of the top producer (China - 46,900 tonnes)

Vanadium



Ferrovanadium cevheri

Nikel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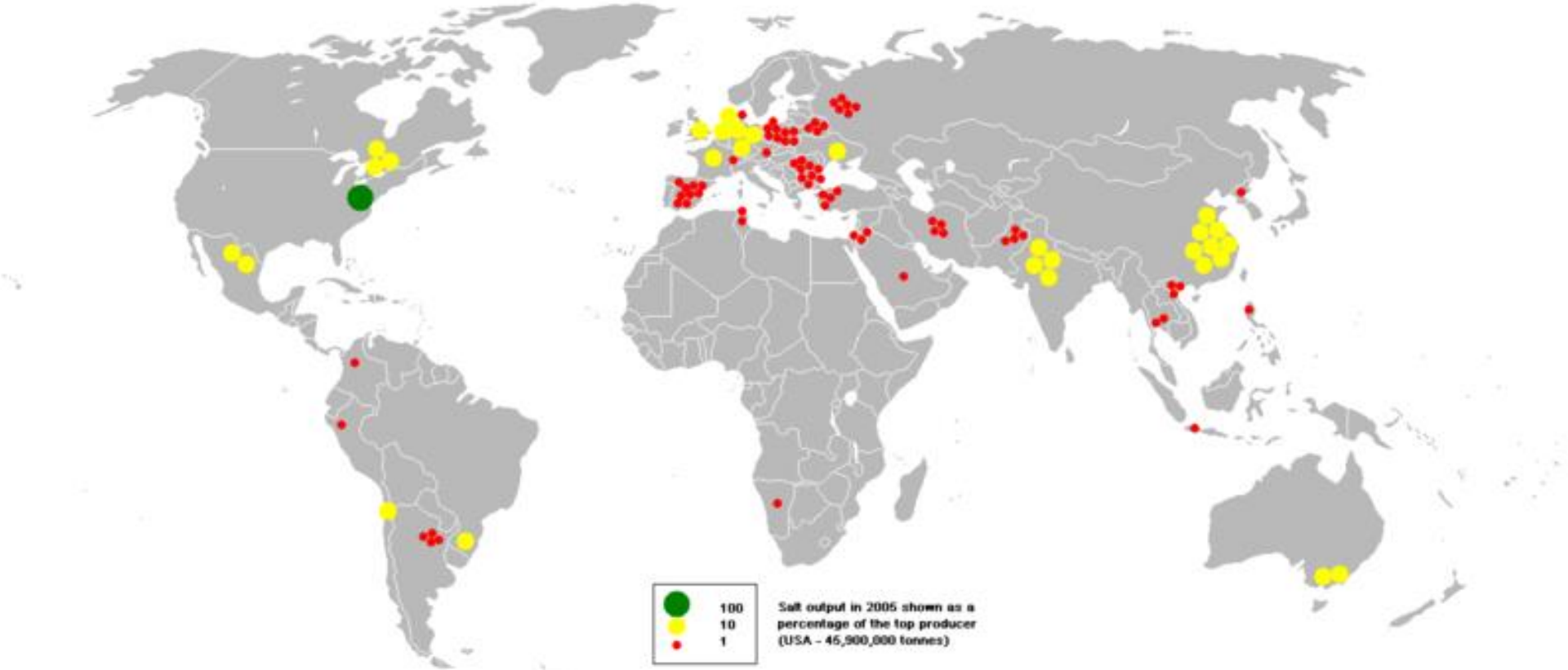
Nickel output in 2005 shown as a percentage of the top producer (Russia – 300,000 tonnes)

3. METALİK OLMAYAN BAZI ÖNEMLİ MİNERALLER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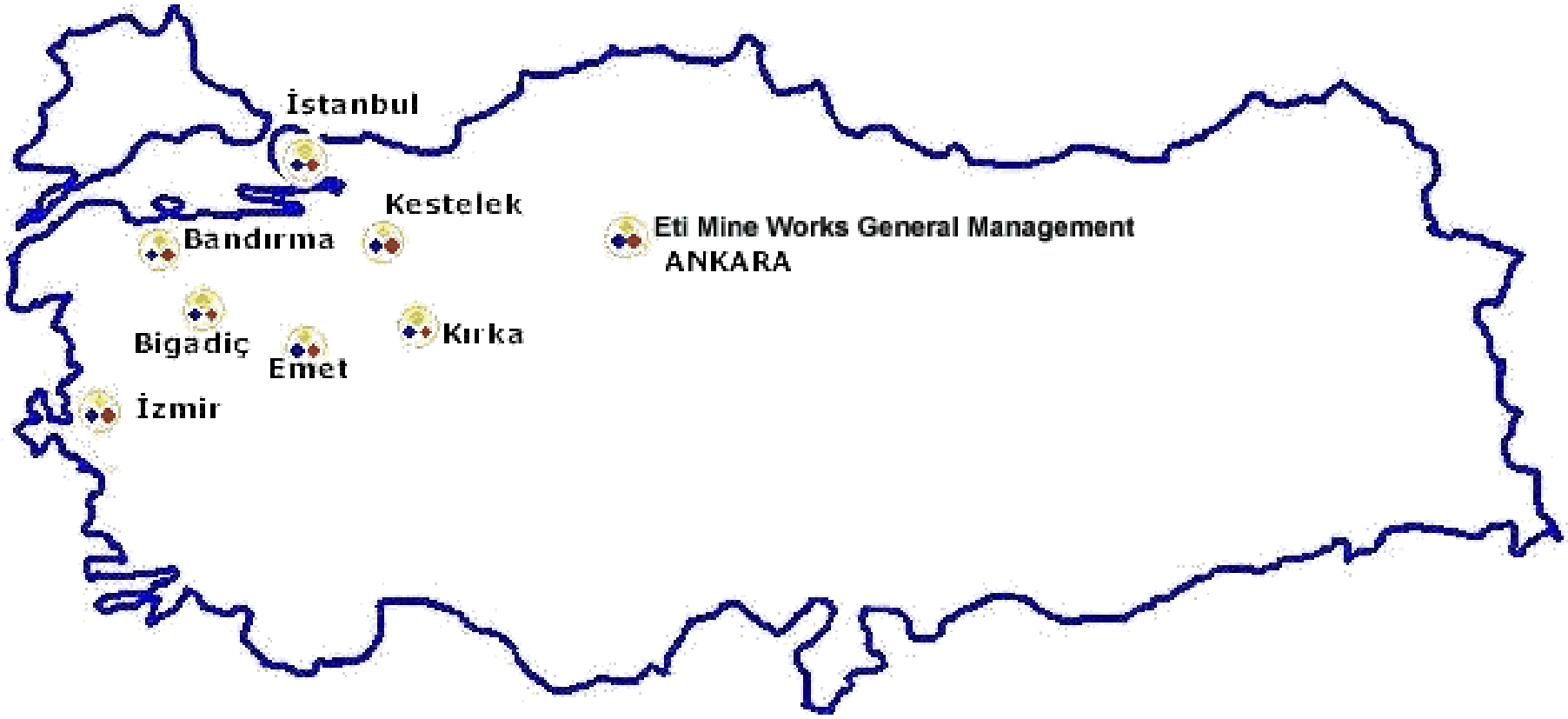
Salt output in 2005 shown as a percentage of the top producer (USA - 46,900,000 tonnes)

Soda (Trona)

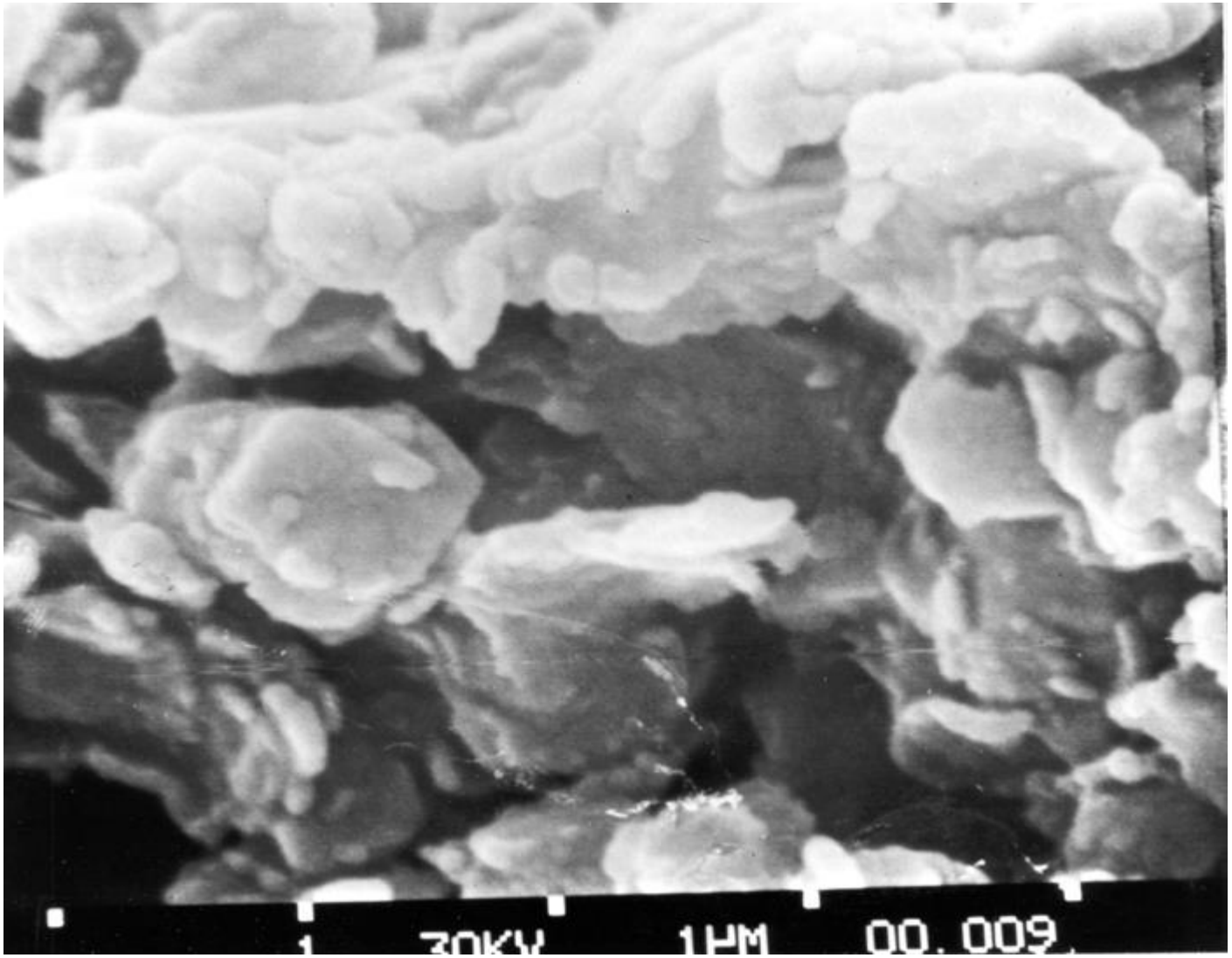
Bor mineralleri

Boraks

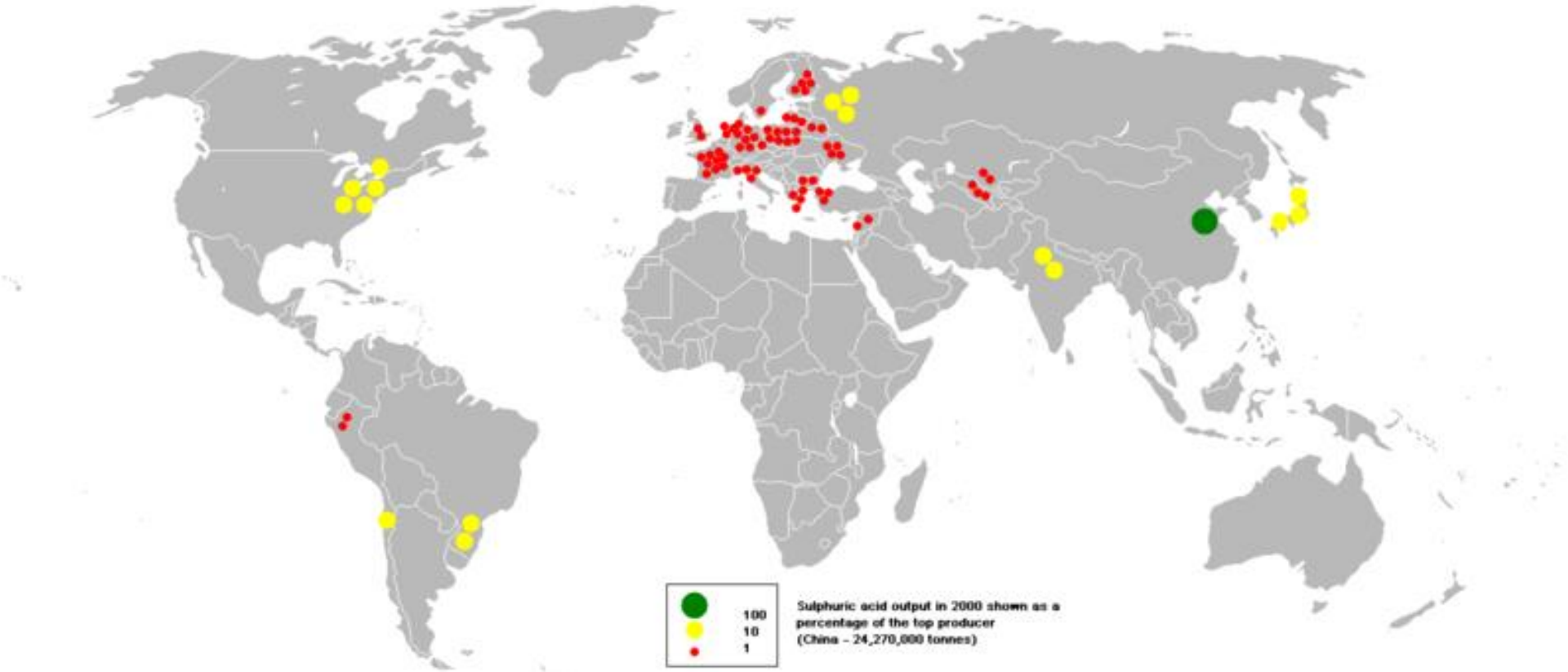


Turkey has about 72% of the world boron reserves, and it is one of the biggest producer in the world. Therefore the operation of boron has primary importance among the other mining operations in Turkey. In order to utilize mining resources more effectively, the boron operation of Turkey has been transferred to Eti Mine by law and it consists the main activities of Eti Mine

Kil, kum, çakıl ve taşlar



Kükürt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1
Sulphuric acid output in 2000 shown as a percentage of the top producer (China – 24,270,000 tonnes)

Can you imagine a science fiction fish living at boiling temperatures in a sulfuric acid environment?

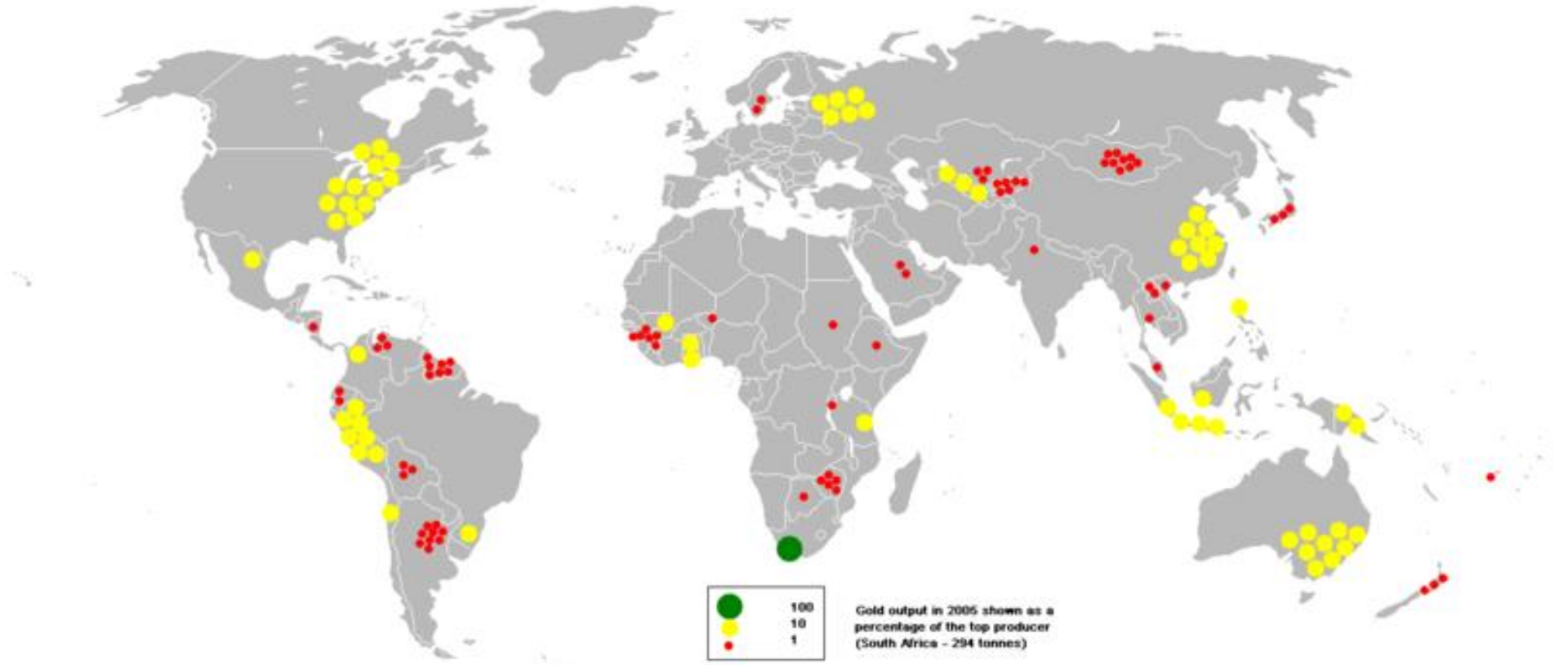
If you do not, you must know that scientists from University of Victoria, Canada, have found a new species of tonguefish (Symphurus) that lives in these conditions.

Mineral gübreler

- Nitrat
- Potas
- Fosfat

4. KIYMETLİ METALLER ve TAŞLAR

Altın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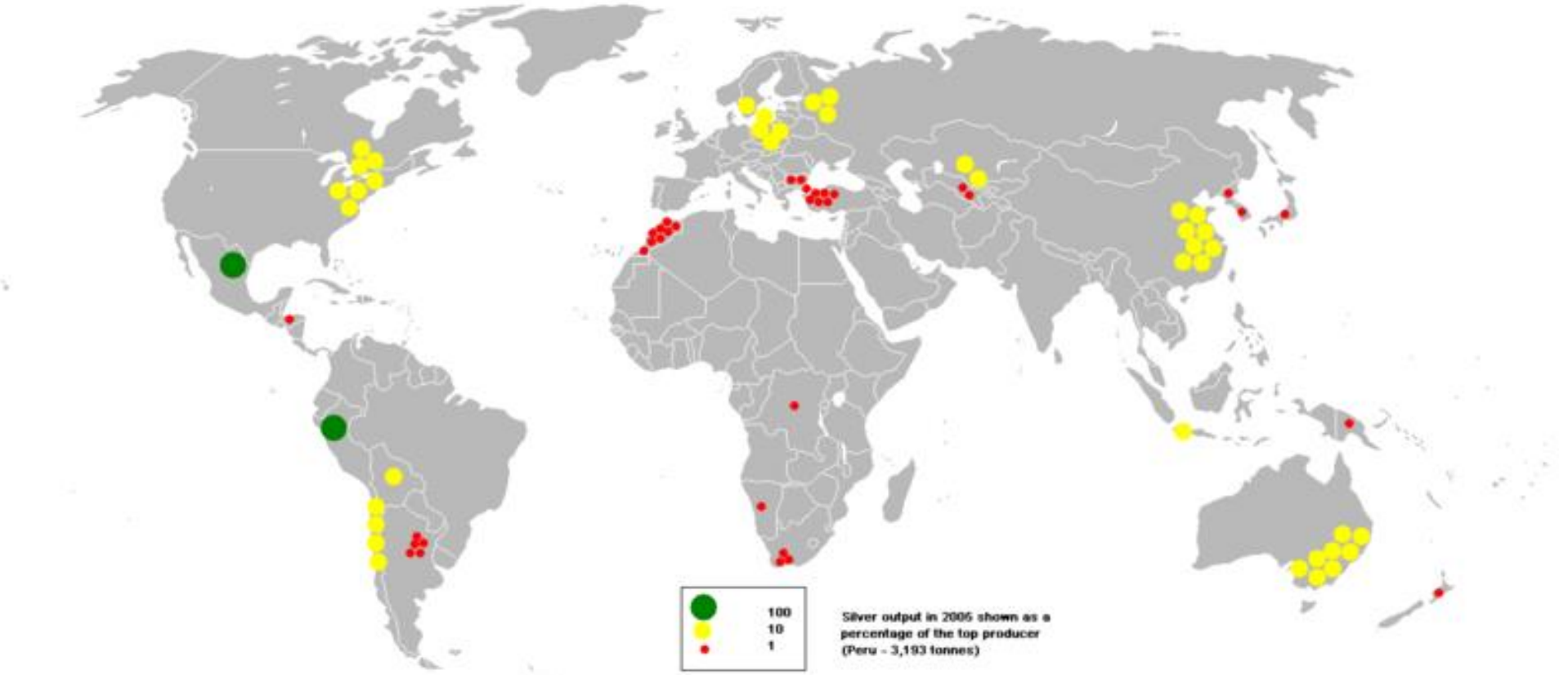
1
Gold output in 2005 shown as a percentage of the top producer (South Africa - 294 tonnes)

Gümüş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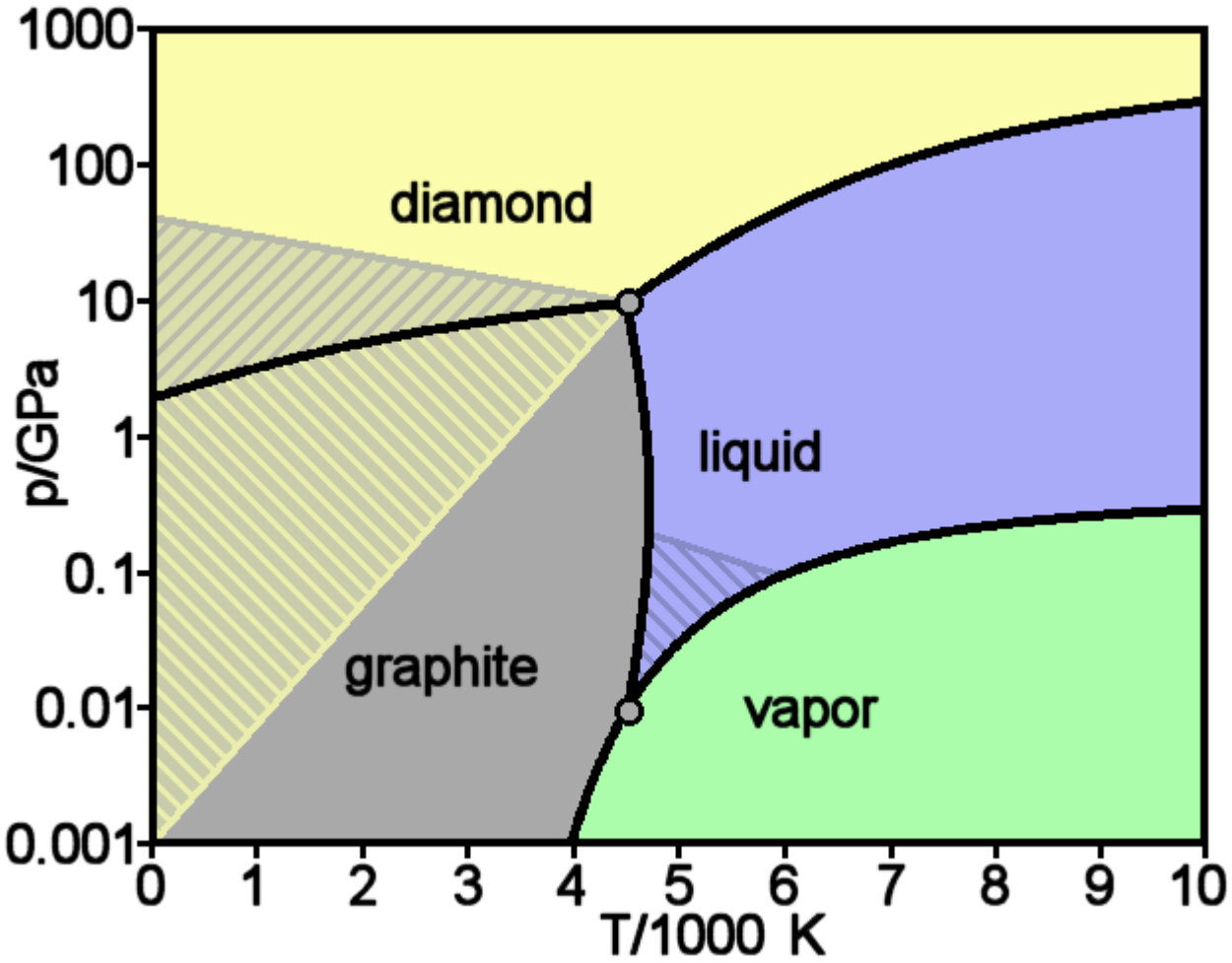
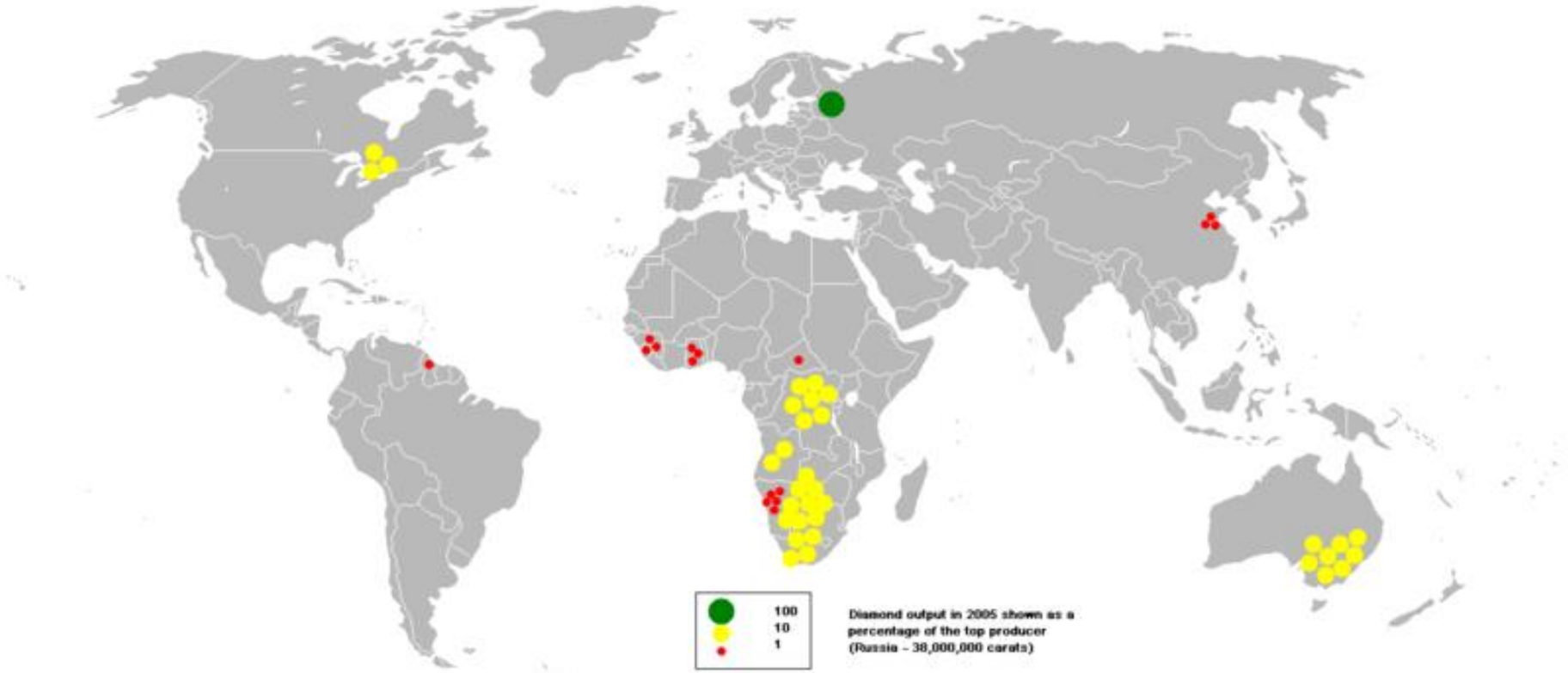
1
Silver output in 2005 shown as a percentage of the top producer (Peru - 3,193 tonnes)

Elmas


1000
100
10
1
0.1
0.01
0.001
p/GPa
diamond
liquid
graphite
vapor
0
1
2
3
4
5
6
7
8
9
10
T/1000 K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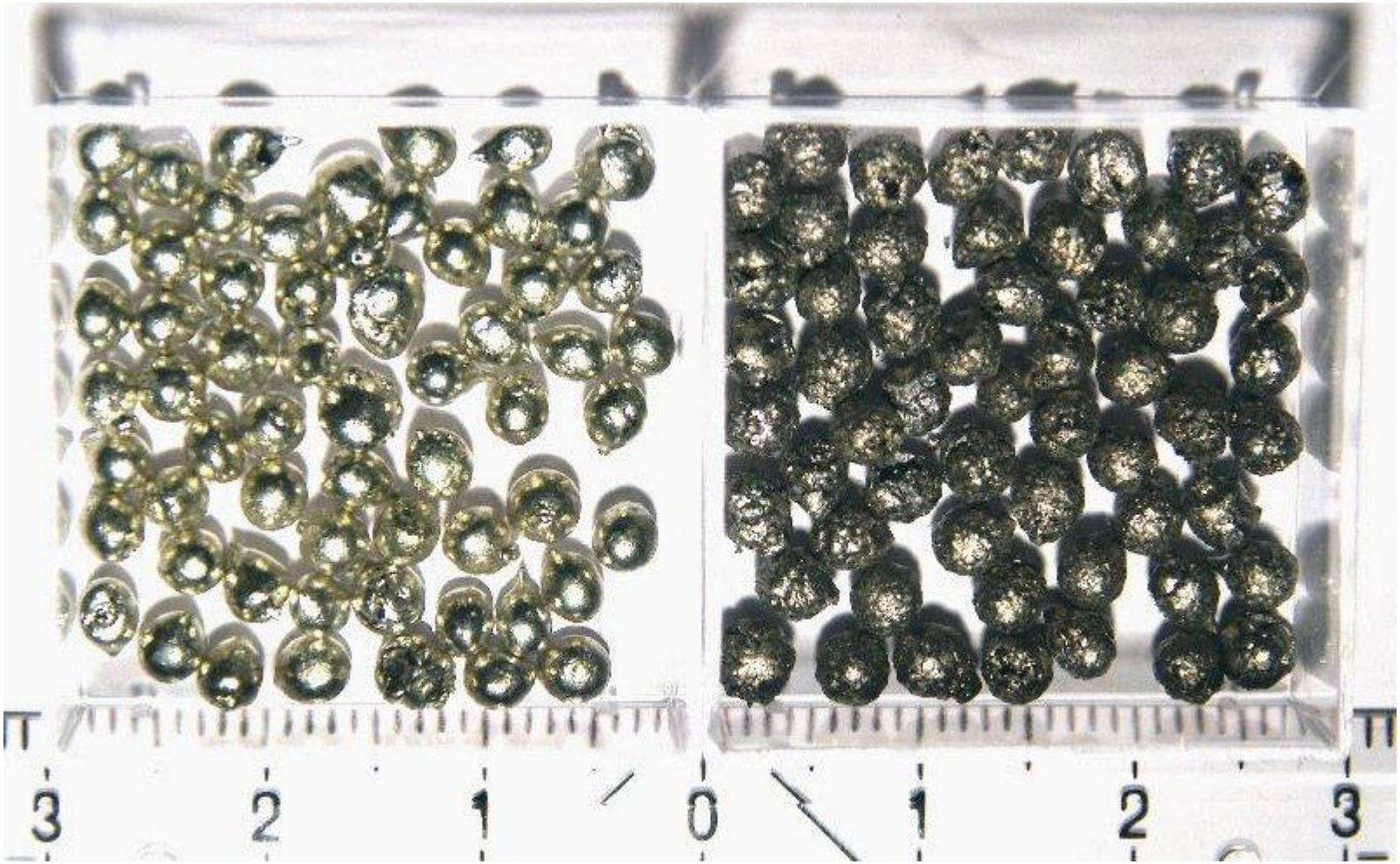
1
Diamond output in 2005 shown as a percentage of the top producer (Russia – 38,000,000 carats)

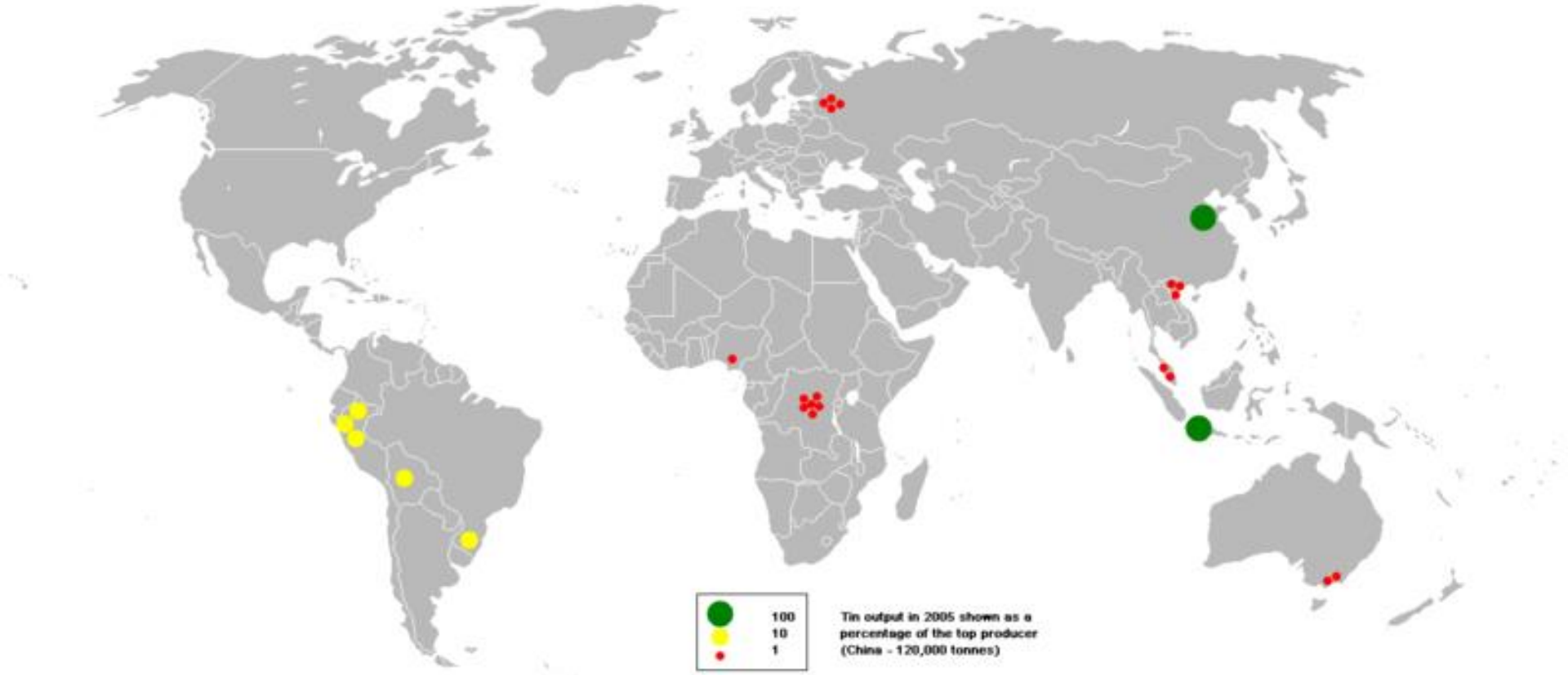
5. DİĞER METALİK MİNERALLER

Boksit (Alüminyum)

estimated Numbers for 2008's total proven bauxite reserves x1000 tonne[1]				
Country	Mine production		Reserves	Reserve base
	2007	2008		
Guinea	18,000	18,000	7,400,000	8,600,000
Australia	62,400	63,000	5,800,000	7,900,000
Vietnam	30	30	2,100,000	5,400,000
Jamaica	14,600	15,000	2,000,000	2,500,000
Brazil	24,800	25,000	1,900,000	2,500,000
Guyana	1,600	1,600	700,000	900,000
India	19,200	20,000	770,000	1,400,000
China	30,000	32,000	700,000	2,300,000
Greece	2,220	2,200	600,000	650,000
Iran	—	500[2]	—	—
Suriname	4,900	4,500	580,000	600,000
Kazakhstan	4,800	4,800	360,000	450,000
Venezuela	5,900	5,900	320,000	350,000
Russia	6,400	6,400	200,000	250,000
United States	NA	NA	20,000	40,000
Other countries	7,150	6,800	3,200,000	3,800,000
World total	202,000	205,000	27,000,000	38,000,000

Kalay

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10
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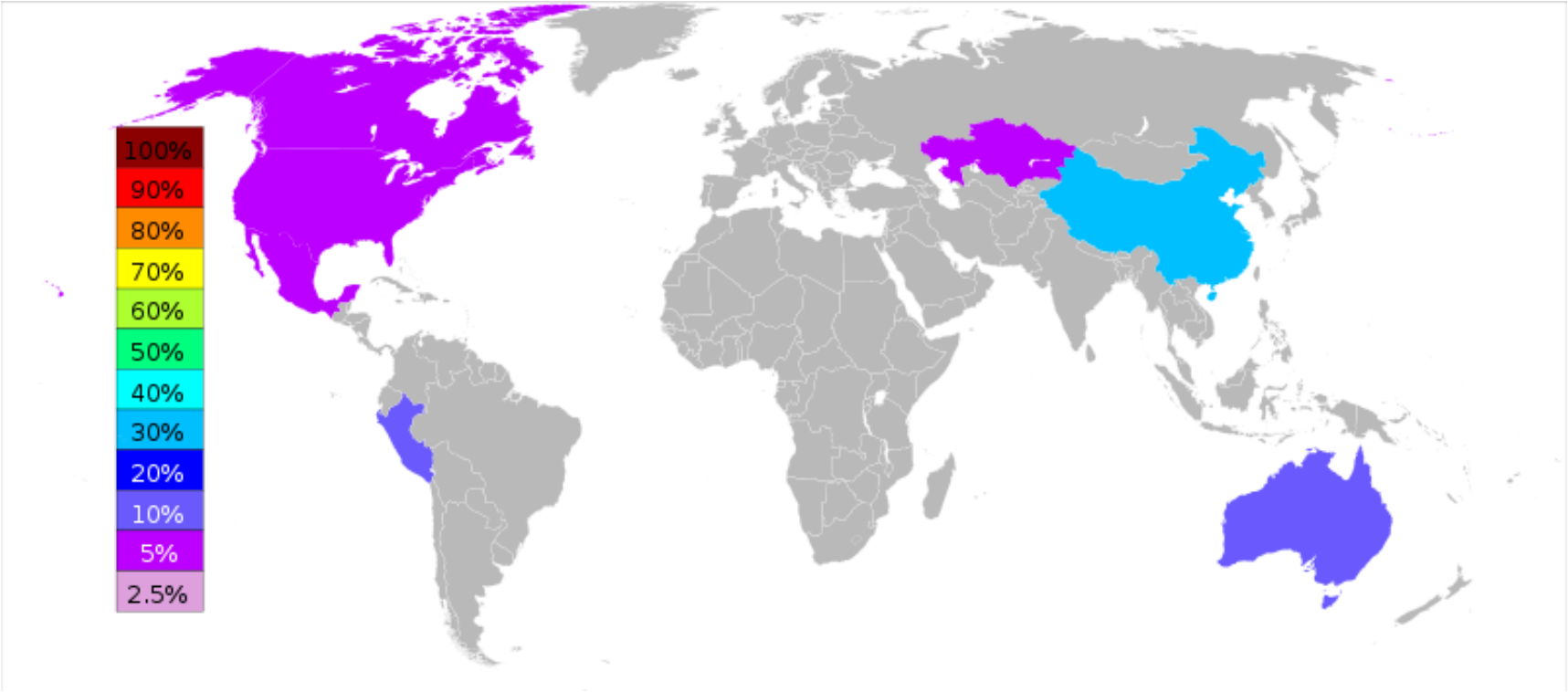
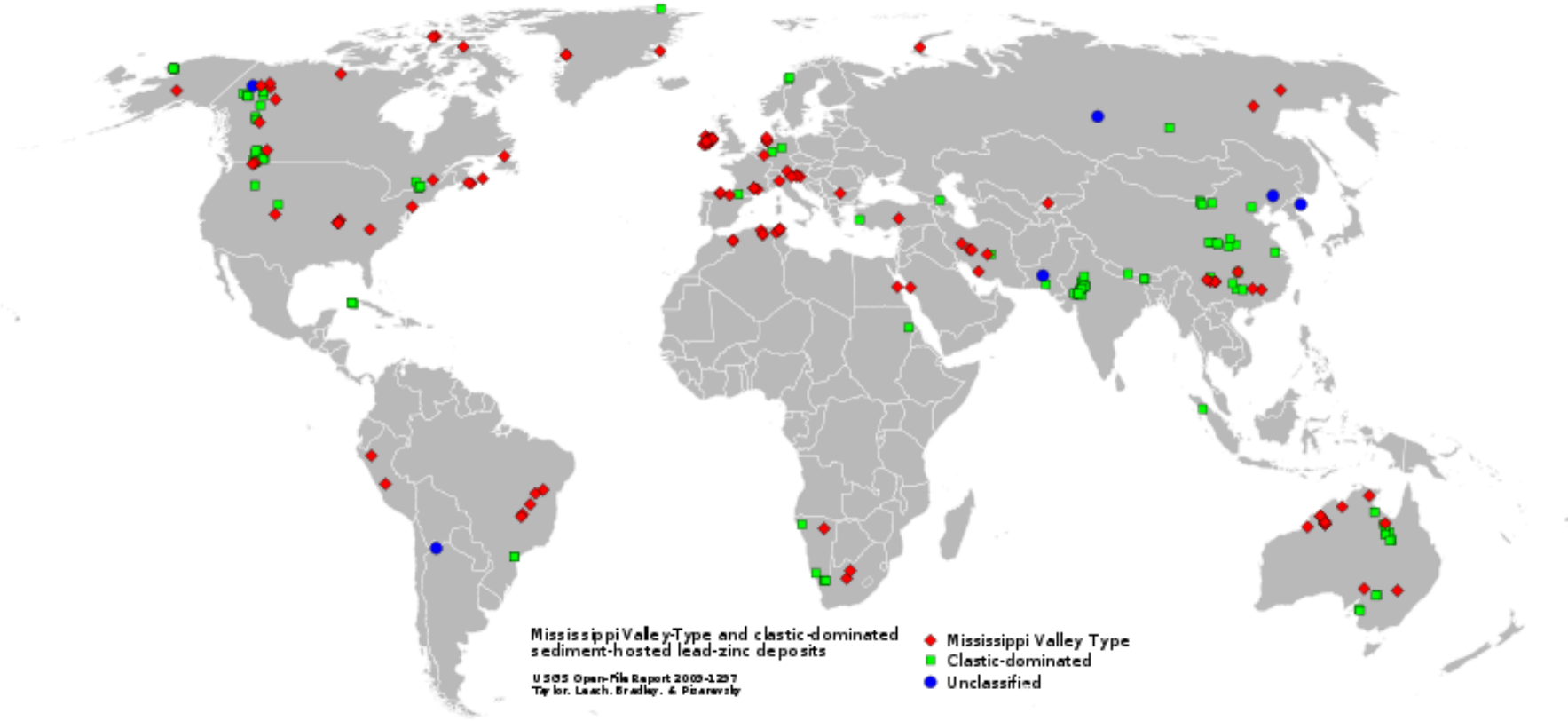
Tin output in 2005 shown as a percentage of the top producer (China - 120,000 tonnes)

Çinko


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
5%
2.5%

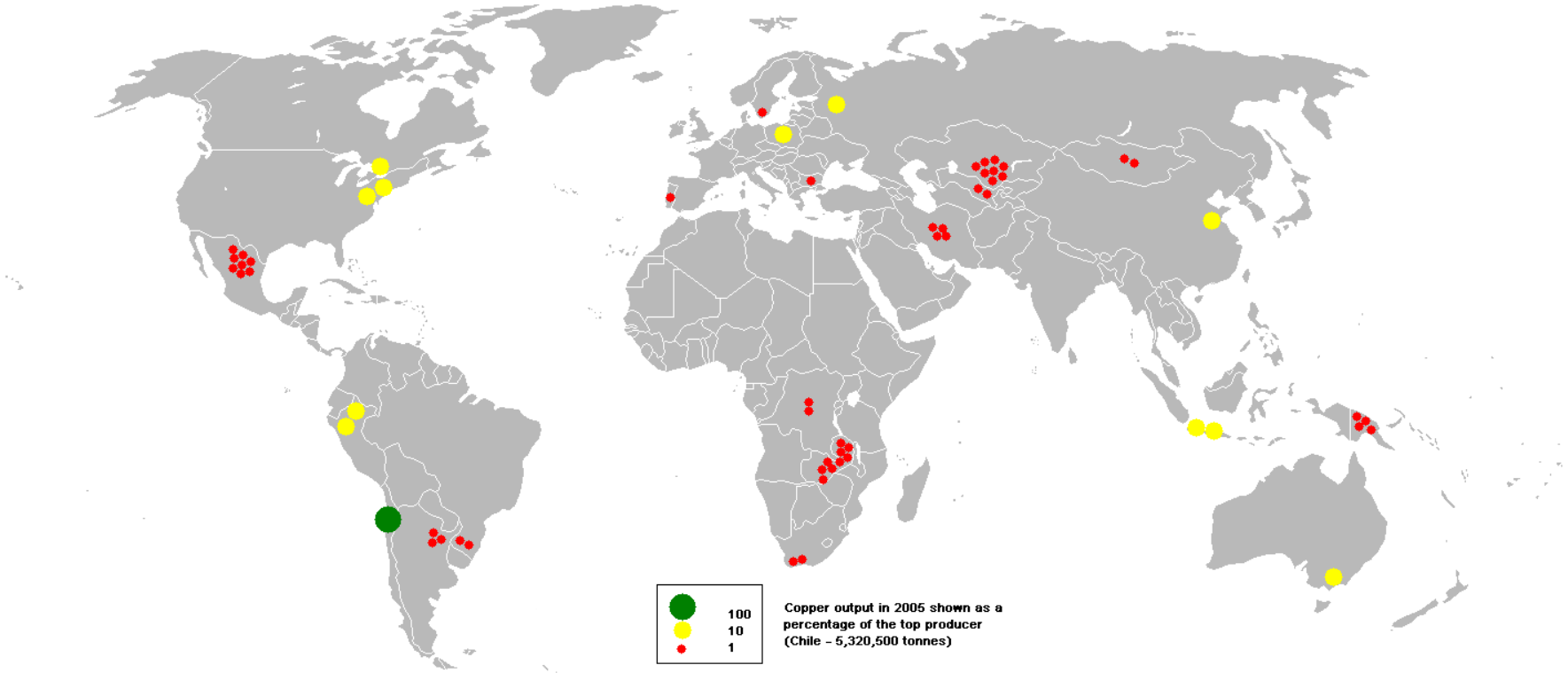
Kurşun


Mississippi Valley-Type and clastic-dominated sediment-hosted lead-zinc deposits
USGS Open-File Report 2009-1297
Taylor, Leach, Bradley, & Pisarevsky
Mississippi Valley Type
Clastic-dominated
Unclassified

Magnezyum

Rank	Country	Production estimate for 2007 (metric tons)
1	China	627,000
2	Russian Federation	37,000
3	Israel	25,000
4	Kazakhstan	21,000
5	Brazil	18,000
6	Canada	16,300
7	Ukraine	2,500
8	Serbia	1,500
Source: USGS[16]		

Bakır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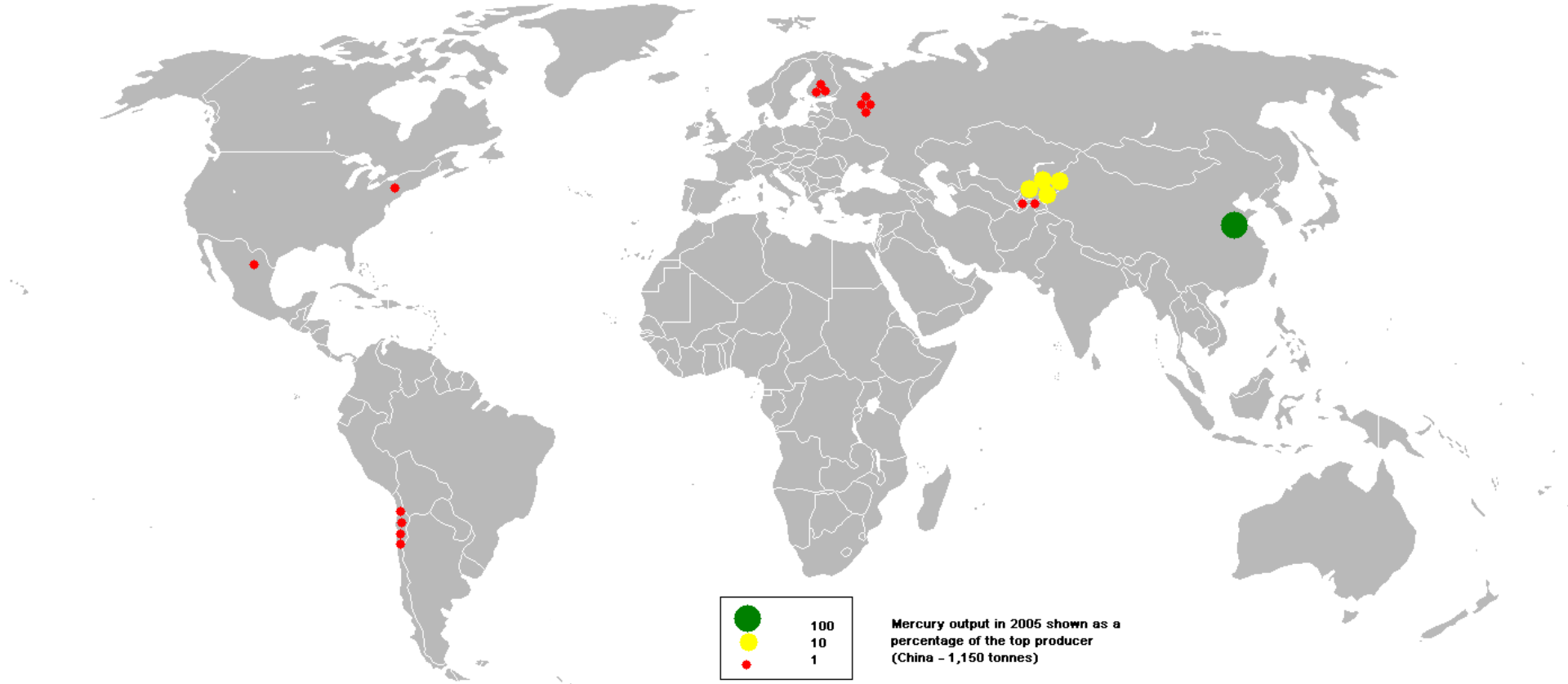
Copper output in 2005 shown as a percentage of the top producer (Chile – 5,320,500 tonnes)

Antimon

Laf-ı güzaf

Country	Tonnes	% of total
People's Republic of China	126,000	84.0
South Africa	6,000	4.0
Bolivia	5,225	3.5
Tajikistan	4,073	2.7
Russia	3,000	2.0
Top 5	144,298	96.2
Total world	150,000	100.0

Civa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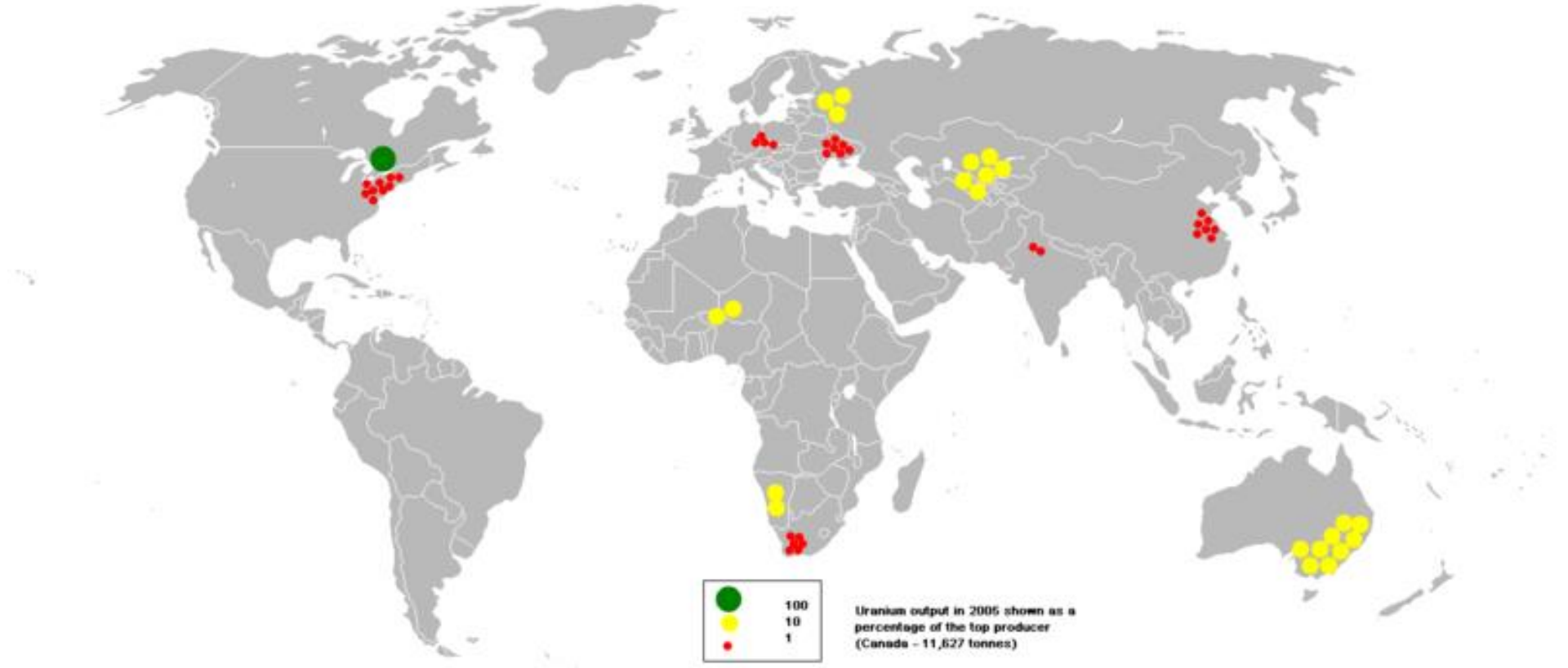
1
Mercury output in 2005 shown as a percentage of the top producer (China – 1,150 tonnes)

Uranyum ve Toryum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Uranium output in 2005 shown as a percentage of the top producer (Canada – 11,627 tonnes)