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“10 Most Terrifying Toxicity of Tellurium Compounds”

The true identity of tellurium that was hidden even though it was released during the Fukushima Daiichi nuclear power plant accident



Association seeking a ruling on the causes of radioactive pollution damage caused by the Fukushima nuclear power plant accident

table of contents

	Title of each page
2	Introducing two types of reports that are the basic documents on "Ten terrifying toxicities of tellurium compounds" (Part 1) "Tellurium and its inorganic compounds (MAK Value Documentation, 2006)"
3	Introducing two types of reports that are the basic documents of "Ten terrifying toxicities of tellurium compounds" (Part 2) "Basic matters regarding substances (11) Tellurium and its compounds (Ministry of the Environment)"
4	The 10 most frightening toxicities of tellurium compounds (Part 1) γ "Chemical toxicity that can be detected by the five senses"
5	Special feature on blue light images caused by tellurium dioxide (TeO ₂) after the world nuclear fission catastrophe
6.10	Terrifying Toxicity of Tellurium Compounds (Part 2) γ "Acute Atomic Bomb Disease + Metallic Taste"
7	The Oak Ridge Report states, "Comparing the number of patients with major initial exposure severity symptoms among those exposed to the "black rain of the Hiroshima atomic bomb"" Rate(%)"
8.10	Terrifying Toxicity of Tellurium Compounds (Part 3) γ "The half-lethal dose LD50 of dimethyl tellurium is more toxic than potassium cyanide." Strong sexuality."
9	Terrifying 10 Major Toxicity of Tellurium Compounds (Part 4) γMetabolic toxicity distributed and accumulated in various organs
9	Tellurium Compounds' 10 Most Terrifying Toxicities (Part 5)γTellurium accumulates in the thyroid gland and reduces stable iodine, causing iodine deficiency and leading to thyroid cancer, hypothyroidism, and enlarged thyroid nodules.
11	Effects of Se (selenium) and Te (tellurium) on thyroid function
12	Terrifying 10 Toxicity of Tellurium Compounds (Part 6) γTellurium compounds irritate the Kieselbach region of the nasal cavity, destroy mucous membranes, and cause nosebleeds.
13	The 10 most terrifying toxicities of tellurium compounds (Part 7) γ Tellurium causes myelin demyelination in peripheral nerves, causing hind limb paralysis, indirect pain, chronic fatigue, etc.
14	"Histocytology and nuclear magnetic resonance analysis of the sciatic nerve in the tellurium model of neurological disease": Title and abstract of the paper Purpose
15	The main cause of consecutive horse deaths at Hosokawa Farm in Iitate Village, Fukushima Prefecture was that before death, the hind legs became paralyzed and buckled, making it impossible to walk.
16	Terrifying 10 Major Toxicity of Tellurium Compounds (Part 8) γTellurium causes congenital malformations in newborns and postpartum disorders (reproductive toxicity) in mothers at the same time.
17	Children are at risk γLow birth weight is a typical example of widespread and frequent occurrence of congenital malformations
18	Terrifying 10 Major Toxicity of Tellurium Compounds (Part 9) γ Genetic Hazardousness of Tellurium Compounds
19	At DPC-registered hospitals in 12 prefectures in eastern Japan, hydrocephalus after a nuclear power plant accident was diagnosed due to tellurium's typical congenital malformation. It was rapidly increasing
20	"Mother holding a child with hydrocephalus" from the documentary film Chernobyl Heart
21	After the Fukushima Daiichi nuclear power plant accident, (1) the number of DPC-registered treatments for malignant thyroid tumors (cancer) in 12 prefectures in eastern Japan, and (2) the excess Absolute number of medical treatments (3) Excess relative medical treatment ratio was rapidly increasing.
22	10 Terrifying Toxicity of Tellurium Compounds (Part 10) γ Stable tellurium (Te-128, Te-130) and radioactive tellurium (Te-127, Te-127m, Te-129, Te- 131, Te-131m, Te-132) were accumulated in large quantities and were released in the nuclear power plant accident.

Introducing two types of reports that are the basic documents on "10 terrifying toxicities of tellurium compounds" (Part 1)

"Tellurium and its inorganic compounds (MAK Value Documentation, 2006)"

Click on the URL below to see the English

version. <https://onlinelibrary.wiley.com/doi/10.1002/3527600418.mb1349480vere0022>

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テルルとその無機化合物 [MAK Value Documentation, 2006] - 主な参考文献 - Wiley Online Library

労働安全衛生のための MAK コレクション: 職場の年間しきい値と分類

自由

テルルおよびその無機化合物 [MAK Value Documentation, 2006]

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概要

シリーズ MAK Value Documentations, Vol. 22 (2006)

この記事には、次のタイトルのセクションが含まれています。

- 毒性効果と作用機序
- 作用機序
- トキシコキネティクスと代謝
 - 吸収・分配・消去
 - 吸収
 - 分布
 - 排除
 - 代謝
- ヒトへの影響
 - 単一露出
 - 吸入
 - 摂取
 - その他の吸収経路
 - 繰り返し露出
 - 皮膚および粘膜への局所的影響
- 動物実験およびインビトロ研究
 - 急性毒性
 - 吸入
 - 摂取
 - 気管内、腹腔内、皮下または筋肉内投与
 - 亜急性、亜慢性および慢性毒性
 - 吸入
 - 摂取
 - 皮下注射
 - 皮膚および粘膜への局所的影響
- 生殖毒性
 - 受胎能力
 - 発生毒性
- 遺伝毒性
- 発がん性
- その他の効果

マニフェスト (MAK値・分類)

<https://onlinelibrary.wiley.com/doi/10.1002/3527600418.mb1349480vere0022>

Introducing two types of reports that are the basic documents on "Top 10 terrifying toxicities of tellurium compounds" (Part 2)

"Basic matters regarding substances {11} Tellurium and its compounds (Ministry of the Environment)"

[11] テルル及びその化合物

環境省

<https://www.env.go.jp/content>

1. 物質に関する基本的事項 [11] テルル及びその化合物

テルルの主な用途は、特殊鋼（鉄鋼の切削性向上）用添加剤、テルル化銅、触媒、合成ゴムの加硫促進剤、ガラス・陶磁器接着剤、感光体セレン合金、テルル化カドミウム（...）
24 ページ

1. 物質に関する基本的事項

(1) 分子式・分子量・構造式

1) テルル

物質名：テルル
CAS 番号：13494-80-9
化審法官報公示整理番号：
化管法政令番号：
RTECS 番号：WY2625000
元素記号：Te
原子量：127.60
換算係数：1 ppm = 5.22 mg/m³ (気体、25°C)

No.	物質名	CAS No.	化審法官報公示整理番号	RTECS 番号	分子量	化学式
2)	塩化テルル(IV)	10026-07-0	—	WY2635000	269.41	TeCl ₄
3)	テルル酸(VI)	7803-68-1	1-729	WY2350000	229.64	Te(OH) ₆
4)	テルル酸アンモニウム(VI)	13453-06-0	—	WY2415000	227.67	(NH ₄) ₂ TeO ₄
5)	テルル酸ナトリウム(VI)	10101-83-4	1-511 (テルル酸ナトリウム)	WE3850000	237.58	Na ₂ TeO ₄
6)	亜テルル酸ナトリウム(IV)	10102-20-2	1-511 (テルル酸ナトリウム)	WY2450000	221.58	Na ₂ TeO ₃
7)	亜テルル酸カリウム(IV)	7790-58-1	—	WY2420000	253.79	K ₂ TeO ₃
8)	ジメチルテルル(II)	593-80-6	—	PB3502500	157.67	Te(CH ₃) ₂
9)	二酸化テルル(IV)	7446-07-3	1-557	WY2675000	159.60	TeO ₂

(注) 物質名に併記したローマ数字は、酸化数を示す。

(2) 物理化学的性状

本物質の性状は以下の通りである。

No.	化学式	性状
1)	Te	無定形テルル：灰色粉末 ¹⁾ 、金属テルル：銀灰色、金属光沢のある六方晶系に属するもろい結晶 ¹⁾ 、気体テルル：黄金色 ¹⁾ 常温常圧で灰色の粉末 ²⁾
2)	TeCl ₄	無色吸湿性結晶 ⁴⁾
3)	Te(OH) ₆	白色の重結晶 ³⁾

10 Terrifying Toxicities of Tellurium Compounds (Part 1) ÿ “Chemical toxicity that can be detected by the five senses”

Note 1: Authoritative sources who have promoted atomic bombs and nuclear power plants have explained that “radioactivity has no taste or smell, so it cannot be detected.”

However, testimonies of residents who suffered from the atomic bomb and nuclear power plant accidents indicate that exposed residents who developed acute atomic bomb illness were able to sense the chemical toxicity

of tellurium with their five senses. Sensing with the five senses (Part 1) Chemical properties that allow toxicity to be detected	
with the five senses ÿ Sensing with the sense of taste	If you inhale tellurium aerosol or ingest tellurium pollutants, you will be exposed to “golden metal”. If you inhale tellurium
ÿ Sensing tellurium through smell ÿ	aerosol or ingest tellurium-contaminated substances, you will smell a “garlic odor (blood odor).”
Sensing through vision	When tellurium (Te) oxidizes to tellurium dioxide (TeO ₂), it generates heat and emits blue light. ÿ (Reference) Next page “Tellurium dioxide after the world nuclear fission catastrophe” Blue light video special feature by (TeO ₂)
ÿ Sensing with the sense of temperature	When entering a plume containing tellurium, you will feel lukewarm air and a strange atmosphere. Jiru
ÿSkin irritation, tactile sensation, pain	If you are exposed to tellurium aerosol , you will experience skin irritation similar to a sudden sunburn, as well as irritation to your eyes, nose,
and throat. ÿSense of sensation	If you inhale tellurium aerosol, or if you are exposed to tellurium pollutants. Oral ingestion will make you feel sick and cause vomiting

10 terrifying toxicities of tellurium compounds (part 1) ÿ

“Acute Atomic Bomb Disease + Metal Taste”

Literature and Experimental Conditions	Acute Atomic Bomb Illness + Metal Taste The book
“Tellurium and Its Compounds” published by the National Institute for Environmental Studies describes the acute toxicity of tellurium as shown on the right. Effects on two patients who were	"Aerosols of tellurium can irritate the eyes and respiratory tract, and affect the liver and central nervous system . When inhaled, it can cause lethargy, dry mouth, metallic taste, headache, garlic odor, and nausea; when ingested, it can also cause abdominal pain, It causes constipation and vomiting. If it gets in your eyes , it causes redness and pain."
accidentally injected with 2 g of sodium tellurite through their catheters.	Cyanosis, vomiting, confusion, loss of consciousness, and kidney pain were observed, and death occurred 4.5 to 6 hours later. Autopsies of the two patients revealed marked cyanosis of the head and neck, yellowing of subcutaneous fat and accumulated fat, browning of the muscles, black discoloration of the bladder and ureters, and congestion of the lungs, liver, spleen, and kidneys . A garlic
Symptoms of a 37-year-old woman who ingested a small piece of meat contaminated with tellurium from 4 weeks ago.	odor was observed several hours later, followed by nausea, vomiting, a metallic taste in the mouth, and a pronounced garlic odor in breath, sweat, and excrement. The next day, he developed a fever, nausea, and vomiting. Hair loss was observed after 2 weeks . At the time of admission, there was petechiae in the stomach and inflammation of the gastric mucosa. After eight weeks, the hair loss stopped, but the garlic odor on her breath persisted .

The table below shows the Oak Ridge Report's "People who encountered the black rain of the Hiroshima atomic bomb."

Quoted from "Number of patients with symptoms and proportion (%) of initial exposure severity (major)"

Note 1: A very important document was published in December 1972 regarding the conditions and effects of exposure to black rain. Oakley, which had been dormant at the Radiation Effects Research Institute (Japanese research institute that succeeded ABCC).

AN EXAMINATION (ORNL-TM-4017, 1972): AN EXAMINATION

OF A-BOMB SURVIVORS EXPOSED TO FALLOUT RAIN AND A COMPARI

A study of atomic bomb survivors exposed to atomic bombs and comparisons with similar

subjects). Note 2: The "severe atomic bomb symptoms" in the table below are similar to the "acute atomic bomb symptoms + metallic taste" introduced on page 6.

Ta.

Note 3: On August 5, 2018, 73 years after the atomic bomb was dropped, the Mainichi Shimbun reported, "The Hiroshima atomic bomb 'tasted like lead.'"

An article with the headline "La Gay Crew Testimony" was published.

Severe atomic bomb symptoms	Onset period	Number of patients	ratio (%)
Oropharyngeal lesions		13	5.51
	Onset within 22-60 days	3	1.27
	Others (including no symptoms)	220	
Pain in the mouth	Onset within 21 days	10	4.24
	Onset within 22-60 days Other	2	0.85
	(including no symptoms) Onset	224	
Gingival pain	within 21 days Onset	5	4.24
	within 22-60 days Other	3	0.85
	(including no symptoms)	228	
Gingival bleeding	Onset within 21 days	11	4.66
	Onset within 22-60 days	4	1.69
	Others (including no symptoms)	221	
purpura	Onset within 21 days	7	2.91
	Onset within 22-60 days Other	3	1.2
	(including no symptoms) Onset	226	
Other bleeding	within 21 days Onset	1	0.42
	within 22-60 days Other	0	0
	(including no symptoms)	235	
Non-purpuric hemorrhage	Onset within 21 days	11	4.66
	Onset within 22-60 days	1	0
	Others (including no symptoms)	224	
Hair removal	Mild (less than 1/4)	142	60.17
	Moderate (1/4 to 3/4 or less) Severe	13	5.51
	(3/4 or more) Symptoms	2	0.85
	have occurred, but the severity and timing of onset	5	2.11
	are unknown Other (including no symptoms)	74	

10 Terrifying Toxicity of Tellurium Compounds (Part 3) ÿ "Dimethyltetra Lulu's half-lethal dose, LD50, is more toxic than potassium cyanide."

Note 1: Toxicity varies depending on the chemical structure of tellurium compounds. Toxicity due to such chemical structure Strength and weakness are also known for arsenic compounds.

Note 2: The half-lethal dose of tellurium compounds in animal experiments is the oral ingestion of dimethyltellurium in rats. 7.5 mg/kg, which is higher acute toxicity than potassium cyanide's 10 mg/kg.

Animal species and routes	Tellurium: half-lethal dose of Te
Oral intake for rats	LD50 is 83mg/kg
Rat ingestion	LC50 is below 2420mg/m ³ (4hr)
	Tellurium dioxide: semi-lethal dose of TeO ₂
Oral intake for rats	LD50 is less than 5000mg/kg
	Telluric acid: Half lethal dose of Te(OH) ₆
Rabbit oral intake	LDLo is 56mg/kg
	Dimethyltellurium: semilethal dose of Te(CH ₃) ₂
Oral intake for rats	LD50 is 7.5mg/kg
Rat ingestion	LD50 is below 116.6mg/m ³

10 Terrifying Toxicity of Tellurium Compounds (Part 4) \ddot{y} Metabolic Toxicity Distributed and Accumulated in

Various Organs Basic Literature on the Metabolic Toxicity of

Tellurium (1) "Tellurium and Its Compounds" published online by the National Institute for Environmental Studies "Than

Metabolism experiments on tellurium.	Kinetics and metabolism of tellurium and distribution after inhalation and oral intake. and
Results of forced oral or intraperitoneal administration of 0.05 \ddot{y} g Te of tellurite labeled with Te-127m (half-life 109 days) to rats.	10.2-15.5% of the cumulative dose was absorbed from the gastrointestinal tract. The radioactivity in fetal tissues reaches an equilibrium state after 1 to 2 hours, and approximately 10% of the radioactivity in the fetus is in the kidneys, approximately 5% in the blood (over 90% red blood cells), and 2% in the liver and femur. After 200 days, approximately 19% of the radioactivity in the body was in the femur, 5% in the kidneys, and 1% in the blood and liver.

10 Terrifying Toxicity of Tellurium Compounds (Part 5)

\ddot{y} Tellurium accumulates in the thyroid gland and reduces stable iodine, causing iodine deficiency and leading to thyroid cancer, hypothyroidism, and enlarged thyroid nodules.

\ddot{y} Title of the paper: "Effects of selenium and tellurium, activity of the selenium-containing enzyme glutathione peroxidase, type I iodothyronine deiodinase, trace element thyroid levels, and thyroid hormone status in rats": \ddot{y}

Title of the journal in which the paper was published: Biological Trace Element Research,

Vol 116, 2007. \ddot{y} Author: VLADISLAV TOPOCAN, a researcher at the Charles University School of Medicine in the

Czechoslovak Republic, and others: \ddot{y} How to obtain the paper: <https://pubmed.ncbi.nlm.gov>

DOI:10.1007/BF02989087 \ddot{y} Conclusion of the paper: "Tellurium Stable iodine in the thyroid glands of rats fed contaminated water with tellurium alone or in combination with tellurium, selenium, and zinc was lower than that of control male rats fed uncontaminated water. It

has decreased to

65-70%." Summary of the paper "Tellurium and selenium belong to the same chemical family (group 16).Selenium is an essential element that is closely related to the function of the thyroid gland.The consumption of tellurium is increasing in industrial processes. Very little is known about the reproductive activity of tellurium, especially its interactions with selenium-containing components in cellular tissues....Tellurium accumulates in the thyroid gland.

Thyroid elements in rats fed contaminated water combined with selenium and zinc were reduced by 65% to 70%

compared to control female rats fed uncontaminated water. The paper included a table of experimental results. Below are two important

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Effects of Selenium and Tellurium on the Activity of Selenoenzymes Glutathione Peroxidase and Type I Iodothyronine Deiodinase, Trace Elements Thyroid Level, and Thyroid Hormone Status in Rats

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ABSTRACT

Tellurium (Te) and selenium (Se) belong chemically to the VIA group of elements. Se represents an essential element closely related to thyroid function. Te has growing application in industrial processes. Little is known about the Te biological activity, particularly with respect to potential chemical interactions with Se-containing components in the organism. In this study, female Wistar rats (body weight: 115–120 g) received sodium selenite pentahydrate (10 mg/L) or sodium tellurite (9.4 mg/L) in drinking water for 6 wk. Additional groups of rats received their combination with zinc sulfate heptahydrate (515 mg/L). The stimulation of 5'-DI-I

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Effects of Se (selenium) and Te (tellurium) on thyroid function

Table 3: Te (tellurium), Se (serum) in the thyroid glands of rats fed uncontaminated water (target) and contaminated water. Accumulation of Zn (Ren), Zn (Zinc) and Iodine

Important points that can be seen from Table 3:

• The amount of Te accumulated in the subject rats given uncontaminated water was below the detection limit and stable.

Uron is 446 µg/g. • The amount of Te accumulated

in rats given water contaminated with tellurium compounds was 0.78 µg/g, which was higher than that of rats given water contaminated with tellurium compounds.

This was the largest amount accumulated.

• The stable iodine accumulation in rats fed tellurium compound-contaminated water was 284 µg/g, compared to non-contaminated water.

The amount accumulated was 162 µg/g, which was 0.64 times the amount

accumulated in water rats. • The stable iodine accumulation in rats given water contaminated with tellurium compounds was 284 µg/g.

This is the lowest stable iodine accumulation in rats. • Se plays

an important role in thyroid hormone circulation through Se-containing enzymes known as deiodinases.

When the contaminated water is a mixture of Te+Se, tellurium, and selenium, the amount of Te accumulated in the thyroid gland is 0.51 µg/g, and the amount of stable iodine accumulated is 318 µg/g, compared to Te alone.

Compared to the case of

The amount of tellurium is increased compared to the case of tellurium contamination alone.

Effects of Se and Te on Thyroid Function 7

Table 3
Te, Se, Zn, and Iodine Concentration in the Thyroid Gland of Control and Treated Rats

Group	Te	Se	Zn	I
Control	<d.l.	0.21 ± 0.11	17.4 ± 2.8	446 ± 108
Se	<d.l.	1.08 ± 0.40**	19.3 ± 1.5	455 ± 64
Te	<u>0.78 ± 0.08</u>	0.34 ± 0.15	25.1 ± 6.2*	<u>284 ± 51**</u>
Se+Te	0.51 ± 0.12 [#]	1.31 ± 0.45**	22.1 ± 3.6*	318 ± 63*
Zn	<d.l.	n.a.	20.5 ± 2.5	380 ± 57
Se+Zn	<d.l.	1.44 ± 0.57**	20.6 ± 2.4*	313 ± 92*
Te+Zn	0.61 ± 0.16 [#]	n.a.	19.1 ± 1.5	287 ± 57**

Note: Results are given as mean ± SD; Concentrations are given in µg/g of wet tissue. n.a. = not analyzed; <d.l. = under detection limit.
* p<0.05 versus control group.
** p<0.01 versus control group.
[#] p<0.05 versus Te group.

10 Terrifying Toxicity of Tellurium Compounds (Part 6) Tellurium compounds irritate the Kieselbach region of the nasal cavity, destroy mucous membranes, and cause nosebleeds. Note: Tellurium aerosol

irritates the eyes and respiratory tract and produces a metallic taste . Garlic odor, dry mouth, headache,

Causes nausea. A study of 40 workers exposed to tellurium at a Canadian smelter found that

There was eye irritation. The area where nosebleeds tend to occur is 1 cm to 1.5 cm from the nasal cavity entrance as shown in the figure below.

This is the Kieselbach site. There, the surface of the blood vessels is mostly protected.

Because of this, even the slightest injury can easily cause nosebleeds. The poisonous tellurium is highly irritating to the nose, eyes, and

skin and can cause nosebleeds. Children are prone to nosebleeds for three reasons: 1) The nasal mucous membrane is thin and the

blood vessels are small, 2) Children often pick their noses when irritated, and 3) they get hot easily. Fukushima Daiichi nuclear power plant

After his death, nosebleeds among children became a major problem not only in Fukushima Prefecture but also in a wide area of eastern Japan. nosebleed

This is a typical effect of tellurium irritant poison and is a type of acute atomic bomb syndrome.

テルルの毒性により鼻血が出るメカニズム

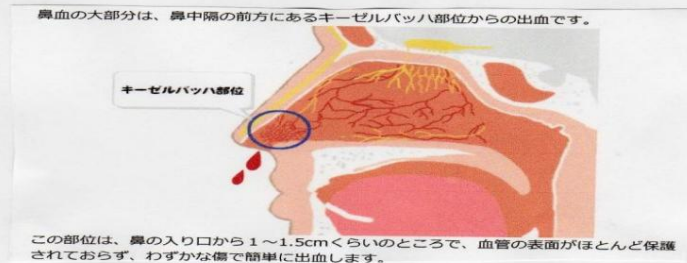
国立環境研究所発行の「テルル及びその化合物」10p には、テルルの毒性について以下の記述がある。

「テルルのエアロゾルは眼、気道を刺激して、肝臓、中枢神経に影響を与えることがある。吸入すると嗜眠、口内乾燥、金属味、頭痛、ニンニク臭、吐き気を生じ、経口摂取ではさらに腹痛、便秘、嘔吐を生じる。目に入ると発赤、痛みを生じる」とある。

ヒトに対する毒性では「カナダの精錬所でテルル(0.1mgTe/m³)とセレン (0.2mgSe/m³)にばく露された労働者 40 人の調査では、鼻や目の刺激、消化不良、胃痛、疲労感の訴えが有意に多かった」

以上のように、テルルのエアロゾルは刺激性があり鼻や気道や目の表皮を赤変させたり痛みを感じさせたりするので鼻血を出すことも可能性もある。

鼻血が出やすい場所は図1に示す「キーゼルバッハ部位」である。鼻の入り口から1～1.5cmのところで、血管の表面がほとんど保護されておらず、わずかな傷で簡単に出血する。



出典：図は <https://tagamiclinic.com/nosebleed/index.html> より引用

大人に比べて子供は鼻血が出やすい特徴がある。それは①鼻の粘膜が薄く血管が細い②よく鼻ほじる③のぼせやすい、からである。そこへテルルを吸引した場合、鼻血が出やすくなること。大人でも、キーゼルバッハ部位あたりをティッシュペーパーで強く刺激したり、手でほじったりすると簡単に鼻血は出る。

2011年3月15日から4月末にかけて、福島第一原発から放出された放射性テルル、安定性テルルは、福島県から関東圏だけでなく、北は北海道から沖縄まで全国にまき散らされた。そのため、金属の味と鼻血の被害は、関東圏、関西そして九州にまで及んだ。

10 Terrifying Toxicities of Tellurium Compounds (Part 7) ÿ Tellurium causes myelin demyelination in peripheral nerves, causing paralysis of the hind limbs, indirect pain, chronic fatigue, etc.

Tellurium neurotoxicity experiment	Tellurium causes myelin demyelination in peripheral nerves
Results of 122 male and female rats (72 rats in the control group) treated with tellurium added to their diet at concentrations of 0% and 1.25% for 35 days from 15 days of age.	Paralysis of the hind limbs appeared in the 1.25% group, but this tended to disappear after 6 days . Nodal demyelination was observed in the sciatic nerve after 1 day, and tellurium accumulation was observed in the cytoplasm of nerve Schwann cells after 2 days. Demyelination was also observed in the brachial plexus, but regenerated myelin began to be seen after 11 days. In the 1.25% group, motor nerve conduction velocity remained consistently low until 120 days later.

“Histocytology and nuclear magnetic resonance analysis of the sciatic nerve in the tellurium model of neurological disease”: Title and abstract of the paper

Journal of the Peripheral Nervous System 10:38–46 (2005)

Histological and magnetic resonance analysis of sciatic nerves in the tellurium model of neuropathy

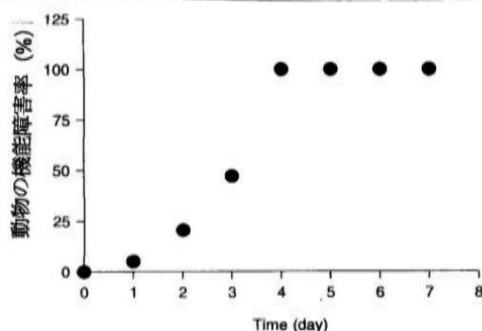
神経病のテルル・モデルにおける坐骨神経の組織細胞学と核磁気共鳴による解析

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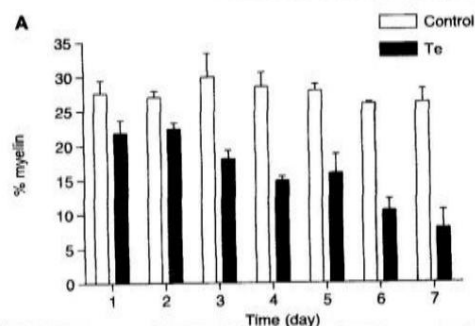
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毒物テルルの摂取は離乳したばかりのラットの後肢の一次的な歩行障害とシュワン細胞の両側で脱髄が生じた。離乳したラットは1.1%のTeが混入し餌が与えられ、様々な時点で坐骨神経の細胞組織学と核磁気共鳴解析がなされた。汚染されていない餌を与えられた対象ラットはどれも後肢の障害を示さなかったが、テルル混入餌を与えられたラットは次第に後肢障害が増えていった。トルイジンブルーで染色された神経周囲は神経内膜のスペースが広げられ、破壊されたミエリン鞘や、膨潤したシュワン細胞、及び軸索の破損が見られた。テルル汚染餌を与えられてから7日目には健全なミエリンは68%減少し、細胞外マトリックスを45%増加させた。

キーワード：軸索障害、ミエリン脱髄、核磁気共鳴、坐骨神経、テルル



テルル毒性は試験期間全体で後肢の機能障害を示した。前もってテルルを与えられたラットは後肢のぎこちない回転運動を起こした。



ミエリン含有量の効果。テルル汚染ラットの神経ミエリン含有量は11.3%にまで減少した。それに対して汚染されていない餌を与えられた対象ラットのシュワン神経細胞は変化がなかった。テルル汚染ラットのミエリン含有量は、テルル摂取汚染日が増えるにしたがって減少していた。

The main cause of continuous horse death at Hosokawa Farm in Iitate Village, Fukushima Prefecture is death. Before this, his hind limbs became paralyzed and buckled, making him unable to walk, a typical symptom of peripheral nerve demyelination.

©細川牧場における鶴姫の死亡前の写真と東北大学の磯貝教授の鶴姫死亡の臨床所見
(1) 三留理男さんの写真集「3.11 FUKUSHIMA 被曝の牧場（具象舎9）」24Pより引用

鶴姫が死亡する前に、後ろ足を挫折して倒れる様子



東北大学の磯貝恵美子教授の鶴姫の臨床所見

三留理男さんの写真集「3.11 FUKUSHIMA 被曝の牧場（具象舎9）」17Pより引用

「鶴姫の解剖は、東北大学の磯貝恵美子教授を中心に、アシスタントの学生たち、久留飛獣医、家畜保健所の職員らの立ち合いのもとで行われた。細川牧場で生まれ育った鶴姫は2013年3月初旬に鈍くなって、今回の臨床所見では、歩行障害や右後肢の異常、関節の腫れ、関節付近の皮下出血などがみられ、骨折が疑われている。また、解剖結果では、肝臓をはじめとする臓器に異常は確認にされなかった。いっぽう、同時に調べられた鶴姫以外の馬の血液検査では、4頭中の3頭で脂質代謝異常（高脂血症）が見られた。」

注：下線部は重要な臨床所見

10 most frightening toxicities of tellurium compounds (part 8) ̈

Tellurium compounds cause birth defects in newborns (developmental toxicity) and maternal postpartum disorders (reproductive toxicity) at the same time.

Reproductive and developmental toxicity of tellurium compounds in animal experiments	
<p>Over 100 rats</p> <p>At concentrations of 0.05, 0.125, 0.25%</p> <p>Pregnancy period by adding tellurium to feed</p> <p>Results of administration to</p>	<p>In the 0.05% group, a small number of mother rats had offspring with hydrocephalus.</p> <p>Although they only gave birth, 100% in the 0.25% group and 60-90% in the 0.125% group had hydrocephalus.</p>
<p>A group of 13 to 14 female rats using tellurium as bait at a concentration of 0.3%.</p> <p>Added and administered throughout pregnancy</p> <p>The result</p>	<p>All pups were born in 20 out of 24 (83.3%).</p> <p>had hydrocephalus. Furthermore, 13% of the pups were stillborn, and the survival rates at 3 days, 10 days, and 1 year were 76%, 26%, and 19%.</p> <p>Suppression of weight</p>
<p>Groups of 13 to 14 rats were treated with terol added to an aqueous methocel solution.</p> <p>1000mgTe/kg/day or more</p> <p>results for groups of</p>	<p>gain in mother rats and low fetal weight</p> <p><small>There are differences in the fetus's mental state, and hydrocephalus and malformations of the tail and legs are seen in the fetus.</small></p> <p>It was seen. In groups receiving 559mgTe/kg/day or more in the diet.</p> <p>Weight loss in mother rats, low fetal weight, malformations, etc.</p> <p>The effect was more pronounced when mixed food was administered.</p>
<p>0~1.5% in 1 group of 24 rats</p> <p>Tellurium was added to the feed at a concentration of</p> <p>Strong sex from 6th to 15th day of pregnancy</p> <p>Results of administration</p>	<p>In the 0.3% or higher group, thinness, vaginal bleeding before delivery, and low activity were observed.</p> <p>The incidence of thinning and vaginal bleeding was 1.5% in the group.</p> <p>was significantly higher. In fetuses, 0.3% or more of</p> <p>Form (mainly hydrocephalus) and variation (delayed ossification of thrust bones and ribs)</p> <p>A significant difference was observed in the incidence of cancer and underweight. Nature</p> <p>In the delivered pups, there was no 7-day survival rate in the 1.5% group.</p> <p>A significant decrease in lateral ventricular dilatation was observed.</p>
<p>Groups of 17 rabbits were fed tellurium at a concentration of 0 to 0.525%.</p> <p>Added to pregnancy from day 6 of pregnancy</p> <p>Results of forced administration up to 18 days</p>	<p>Significant suppression of weight gain and intake in the 0.175% or higher group.</p> <p>Significant decrease in food intake, loose stools, hair loss, thinness, decreased activity</p> <p>A significant increase was observed in the incidence of Also a fetus</p> <p>The incidence of low body weight, malformations and mutations in the 0.525% group</p> <p>An increase was seen in</p>
<p>5 pregnant rats</p> <p>TeO₂-500̈mol/kg feed</p> <p>Administered for 19 days</p>	<p>Maternal weight loss occurred, and 100% of the fetuses had hydrocephalus, edema, proptosis, ocular hemorrhage, umbilical hernia, undescended testes, and decreased kidney size. Tellurium is maternally toxic</p> <p>Both induced teratogenicity in the fetus.</p>

Children are at risk ŷ Typical case of widespread and multiple occurrence of congenital malformations

The case was a low birth weight

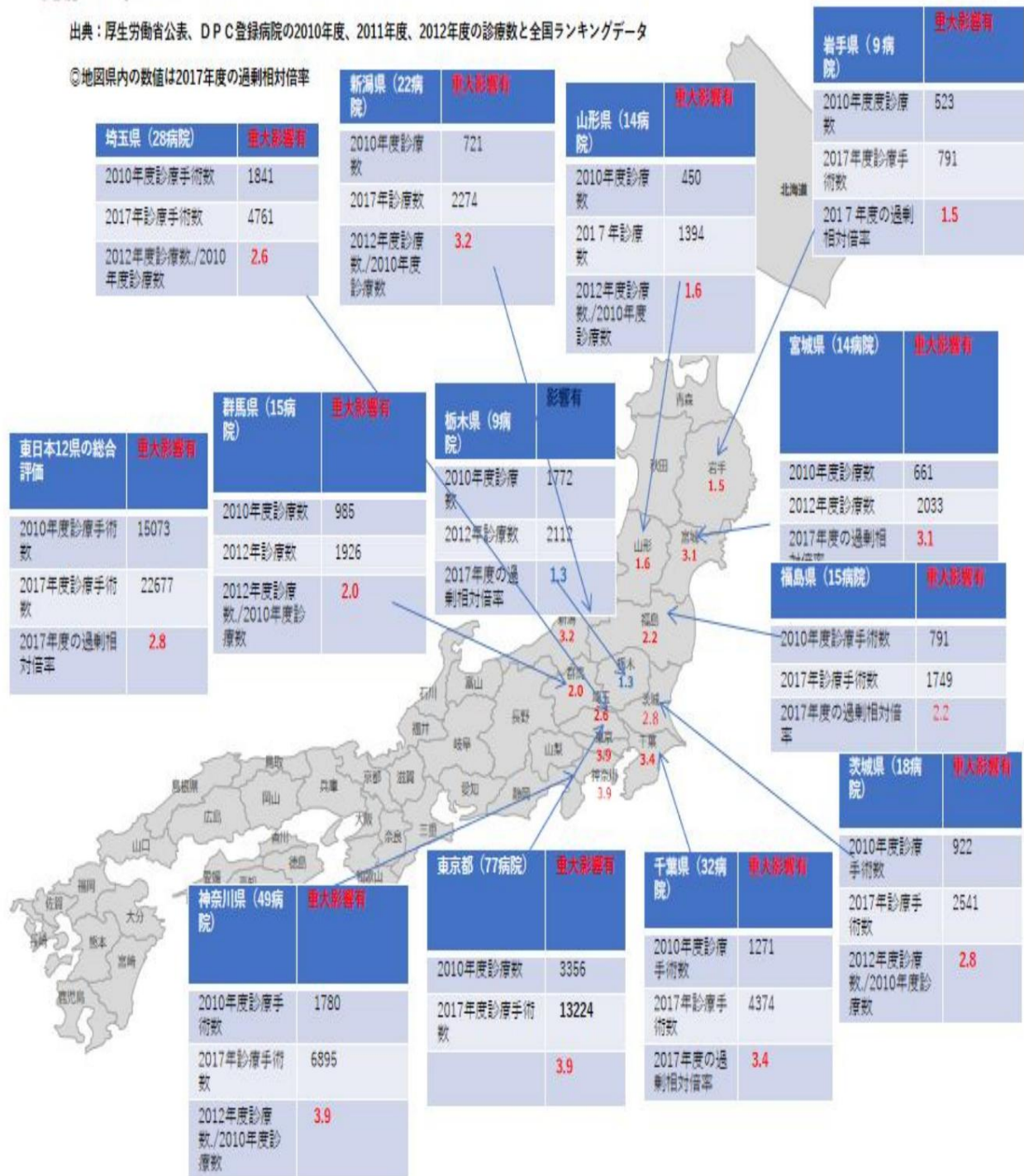
Congenital malformations in newborns in 12 prefectures of eastern Japan after the Fukushima Daiichi nuclear power plant accident: Low birth weight due to shortened gestation period

The number of students was rapidly

increasing. The excess relative ratio in FY 2017 compared to the number of medical treatments in FY 2010 (before the accident) is more than double.

These included Fukushima prefecture, Ibaraki prefecture, Gunma prefecture, Saitama prefecture, Chiba prefecture, Tokyo, Kanagawa prefecture, Miyagi prefecture, and Niigata

prefecture. The overall evaluation for the 12 prefectures in eastern Japan was "Significant Impact" which was 2.8 times higher.



12 prefectures in eastern Japan due to tellurium's typical congenital malformations.

Hydrocephalus cases were rapidly increasing after the nuclear power plant accident at DPC-registered hospitals.

2010年度から 2017年度の東日本 12都県における水頭症の診療手術数と過剰相対倍率

注：東日本2都県156病院の過剰相対倍率(事故前年度比較の診療手術数倍率)は2011年度から2017年度で1.6倍～2.4倍と「重大な影響有(1.5倍以上)」の倍率になっている。

	水頭症の診療手術実績のある病院数	事故前 2010年 診療手術 数	2011 年診療 手術数	2012 年診療 手術数	2013 年診療 手術数	2014 年診療 手術数	2015 年診療 手術数	2016 年診療 手術数	2017 年診療 手術数	2011 年度 の過 剰相 対倍 率	2012 年度 の過 剰相 対倍 率	2013 年度 の過 剰相 対倍 率	2014 年度 の過 剰相 対倍 率	2015 年度 の過 剰相 対倍 率	2016 年度 の過 剰相 対倍 率	2017 年度 の過 剰相 対倍 率
東京都	東京都49病院の総合評価	427	576	737	640	738	762	991	936	1.3	1.7	1.5	1.7	1.8	2.3	2.2
神奈川県	神奈川県36病院の総合評価	247	361	516	490	429	666	403	354	1.5	2.1	2.0	1.7	2.7	1.6	1.4
千葉県	千葉県20病院の総合評価	88	230	163	122	166	279	333	415	2.6	1.9	1.4	1.9	3.2	3.8	4.7
埼玉県	埼玉県16病院の総合評価	11	92	108	81	139	124	148	227	8.4	9.8	7.4	12.6	11.3	13.5	20.6
茨城県	茨城県6病院の総合評価	44	54	47	101	106	75	119	125	1.2	1.1	2.3	2.4	1.7	2.7	2.8
宮城県	宮城県5病院の総合評価	71	49	99	81	84	84	140	117	0.7	1.4	1.1	1.2	1.2	2.0	1.6
福島県	福島県6病院の総合評価		11	10	11	11	13	21	45		0.9	1.0	1.0	1.2	1.9	4.1
群馬県	群馬県4病院雄総合評価	30	111	171	90	95	62	66	82	3.7	5.7	3.0	3.2	2.1	2.2	2.7
栃木県	栃木県3病院の総合評価	12	16	11	11	16	16	11	23	1.3	0.9	0.9	1.3	1.3	0.9	1.9
新潟県	新潟県4病院の総合評価	21	17		26	27		25	11	0.8		1.2	1.3		1.2	0.5
岩手県	岩手県4病院の総合評価	14	16	22	22			12	24	1.1	1.6	1.6			0.9	1.7
山形県	山形県3病院の総合評価		26	22	14	12		26			0.8	0.5	0.5		1.0	
東日本 12都県	東日本12都県156病院の 総合評価	965	1559	1906	1689	1823	2081	2295	2359	1.6	2.0	1.8	1.9	2.2	2.4	2.4

“A mother holding a child with hydrocephalus” from the documentary film Chernobyl Heart



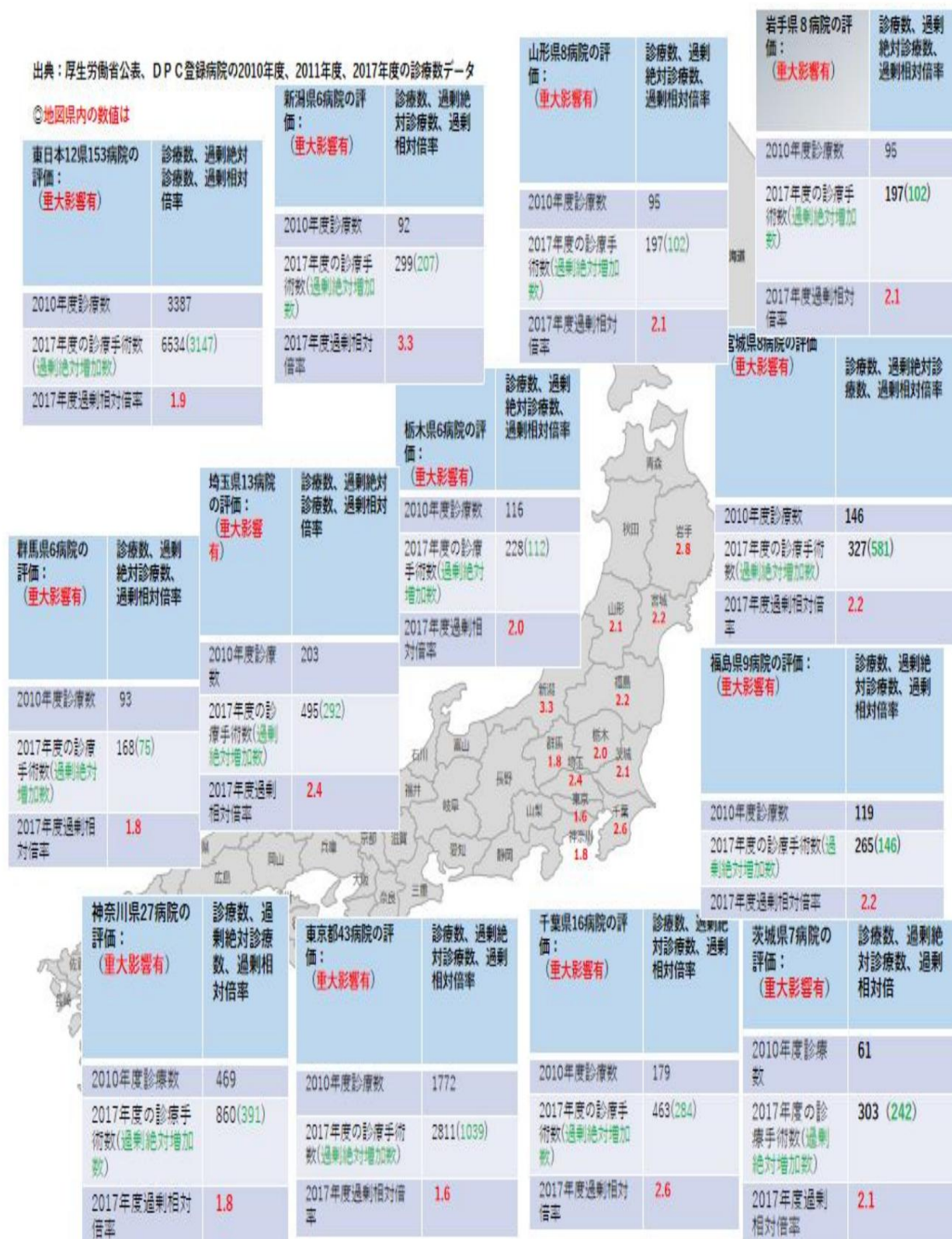
10 Terrifying Toxicities of Tellurium Compounds (Part 9) ÿ Genetic Disorder

Experiments on Tellurium Compounds

Knowledge on Genetic Disorders of Tellurium Compounds ÿ

<p>Knowledge on Genetic Disorders Sodium Tellurite ((Na₂TeO₃), Sodium Tellurate) (in vitro test</p>	<p>(Na₂TeO₄) induced genetic mutagenicity in the metabolic activation system (S9) (Salmonella Typhimurium experimental system without additives) .</p>
<p>ÿS9 Additive-free tellurium dioxide (TeO₂), sodium tellurate findings regarding genetic disorders (in vitro test)</p>	<p>(Na₂TeO₄) induced DNA damage in Escherichia coli. Tellurium chloride, tellurite, and sodium metatellurate (S9 additive-free experimental system) induced DNA damage in Bacillus subtilis.</p>
<p>ÿ Knowledge about genetic disorders</p>	<p>S9-free ammonium tellurate (NH₄)₆TeO₆ induced chromosome breaks in human leukocytes at a dose of 0.03 gTe/ml .</p>
<p>ÿ Knowledge about genetic disorders</p>	<p>Six metals were investigated to induce micronuclei in human lymphocytes, one of which was sodium tellurate (Na₂TeO₄). Blood from two young non-smoking male donors was used for all metal compounds , of which five metal compounds, including sodium tellurate, were targeted at at least one dose (0.02-2.0 gTe/mL). There was a statistically significant induction of micronuclei in comparison.</p>

After the Fukushima Daiichi Nuclear Power Plant accident, 1) the number of DPC-registered medical treatments, 2) the excess absolute number of medical treatments, and 3) the ratio of excess relative medical treatments for thyroid malignant tumors (cancer) in 12 prefectures in eastern Japan rapidly increased. Note 1: In all 12 prefectures of eastern Japan, the excess relative multiple in FY2017 exceeded 1.5 times, resulting in a significant impact.



Note 2: The green value in parentheses is the absolute excess increase in value due to the nuclear power plant accident.

10 Terrifying Toxicity of Tellurium Compounds (Part 10) ü There is stable tellurium in the reactor of a nuclear power plant.

(Te-128, Te-130) and radioactive tellurium (Te-127,

Te-127m, Te-129, Te-131, Te-131m, Te-132) are deposited in large quantities.

ORIGENモデル：福島第一原発事故直後・核分裂停止後の1号機（1日後）、2号機（3日後）、3号機（3日後）の炉心に堆積していたホットパーティクルを形成する核分裂物質の放射能（ Bq）と質量（g）及び毒性の分類
 福島第一原発の1号機から6号機の核燃料と原子炉炉心部と使用済み核燃料にホットパーティクルを形成する核分裂物質（毒物テルル1族、放射性ヨウ素、放射性セシウム）が大量に蓄積されているデータは、原子力研究開発機構が発行している「 JAEAData/Code 福島第一原子力の燃料組評価」に存在していた。

		原発事故前から1号機、2号機、3号機の炉心に堆積していた②放射能（ Bq）と③質量（g）								
		①半減期	1号機炉心部の放射能 (Bq)	1号機炉心部の質量 (g)	2号機炉心部の放射能 (Bq)	2号機炉心部の質量 (g)	3号機炉心部の放射能 (Bq)	3号機炉心部の質量 (g)	④Bq当たりの質量(g/Bq)	⑤毒性の分類
毒物テルル1族	Te-127	9.35時間	9.48E+16	0.7	1.16E+17	1.2	1.20E+17	1.23	1.02E-17	化学毒+放射毒
	Te-127m	109日	8.19E+15	2.4	1.23E+16	3.5	1.34E+16	3.83	2.86E-16	化学毒+放射毒
	Te-128	7.7×10 ²⁴ 年	0	7070	0	6160	0	5810	0	化学毒
	Te-129	69.6秒	3.97E+16	0.03	4.28E+16	0.1	4.53E+16	0.584	1.29E-18	化学毒+放射毒
	Te-129m	33.6日	4.33E+16	37.3	6.95E+16	62.4	7.07E+16	63.5	8.98E-16	化学毒+放射毒
	Te-130	2.7×10 ²¹ 年	0	19840	0	24100	0	22700	0	化学毒
	Te-131	25分	4.06E+16	0.01	2.26E+16	0.01	2.31E+16	0.0109	4.72E-19	化学毒+放射毒
	Te-131m	30日	1.80E+17	2.0	1.01E+17	3.4	1.03E+17	3.49	3.39E-17	化学毒+放射毒
	Te-132	3.2日	1.57E+18	90.8	1.76E+18	157	1.76E+18	157	8.90E-17	化学毒+放射毒
放射性ヨウ素	I-129	1.57×10 ⁷ 年	6.2E+9	9490	7.5E+9	10500	7.1E+9	10800	1.53E-07	放射能毒
	I-131	8.02日	1.26E+18	236	1.87E+18	408	1.86E+18	406	2.18E-16	放射能毒
	I-132	2.3時間	1.84E+18	2.8	1.81E+18	4.7	1.81E+18	4.74	2.62E-18	放射能毒
	I-133	20.8時間	2.65E+17	6.3	4.58E+17	10.9	4.57E+17	10.9	2.38E-17	放射能毒
放射性セシウム	Cs-134	2.065年	1.90E+17	3970	2.76E+17	5770	2.51E+17	5250	2.09E-14	放射能毒
	Cs-137	30.17年	2.02E+17	62700	2.55E+17	79100	2.41E+17	74700	3.10E-13	放射能毒

It was released in a nuclear accident.

[Author introduction] Profile of Mr. Kunihiro Yamada

Born in Osaka in 1943. After completing graduate school at Kyoto Institute of Technology in 1996, became an assistant at the Faculty of Engineering, Osaka University. Professor of Humanities at Kyoto Seika University since 1997. Director of the NPO Kino Environment, Doctor of Engineering, currently professor emeritus at Kyoto Seika University.

Around 1970, he began research into environmental pollution in the Seto Inland Sea and Lake Biwa. Since 1980, he has been working on issues of trihalomethane in tap water and groundwater contamination. Since the late 1980s, he has been working on the issue of golf course overdevelopment, and has been studying environmental studies to find solutions from the perspective of the victims at the sites where environmental problems are occurring. Practicing.

His books include "Golf Course Ruin Theory" (Fujiwara Shoten), "Freon Gas Destroys the Earth (Iwanami Booklet)," "Why 600,000 Cancer Cases Are Increasing in the Tokyo Metropolitan Area (Fuzokusha)," and "Nuclear Fission and the Toxic Tellurium." The Discovery (Fujiwara Shoten)," and many others.

Tellurium Reader No.1 "10 Terrifying Toxicity of Tellurium Compounds"

The true identity of tellurium that was hidden even though it was released during the Fukushima Daiichi nuclear power plant accident

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